ROADS and STREETS

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A GILLETTE PUBLICATION

Gillette Publishing Co., 22 West Maple St., Chicago 10, Illinois • Accepted as Controlled Circulation Publication at Milwaukee, Wis.

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October, 1958

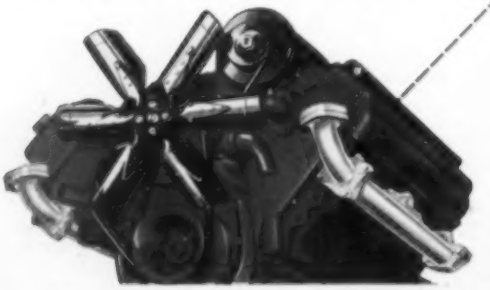
WAYNE EXECUTIVES (left to right): A. W. Carlson, Production Control Manager; Darrel Vincent, Ass't Chief Engineer; Robert Peddicord, Director of Purchases. Kermit Warn (in cab), Experimental Supervisor.

why Wayne Sweepers power with Chrysler Industrial Engines

Wayne sweepers are designed and built for heavy-duty municipal and industrial sweeping. It's tough, dirty work that requires rugged, yet economical power. Wayne Manufacturing Company has found Chrysler Industrial Engines stand up under these demands exceptionally well. Chrysler's oil bath air cleaner protects the engine's working parts in the most extreme dust and dirt conditions. Even at continuous low, lugging speeds Chrysler engines operate coolly, efficiently, economically.

Equally important, manufacturing and purchasing operations are simplified by using Chrysler Power. Engine, transmission and differential are ordered and delivered as a package. Finally, Chrysler Power helps sales because Wayne customers know and respect the reputation of Chrysler Industrial Engines.

CHRYSLER V-8 INDUSTRIAL ENGINE (rear mounted) powers the Wayne Model 550, four-cubic-yard sweeper (shown). Chrysler Ind. 32 (six-cylinder) Engine powers the Wayne Model 450, three-cubic-yard sweeper.



Send for 1958 Chrysler Industrial Engine Catalog:
Dept. G10, Industrial Engine Division, Chrysler Corporation, 12200 Jefferson Ave., Detroit 15, Michigan.

Chrysler
INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

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Bethlehem Beam Guard Rail Engineered for Safety

Bethlehem Beam Guard Rail is fully tested for a minimum breaking strength of 80,000 lb, enough to distribute an impact force over at least 16 posts on either side of the point of collision.

Other advantages in using Bethlehem Beam Guard Rail: high visibility in bad weather or at night, easy erection, low maintenance, trim appearance. These sturdy beams are made from 10- and 12-gage steel.

Our catalog describes all these advantages in detail, and includes valuable engineering data. Just phone or write our nearest sales office for your copy, or write us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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ROADS AND STREETS

A GILLETTE PUBLICATION • OCTOBER, 1958 • VOLUME 101 • NUMBER 10

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Unbalanced Bidding—*Will it ever boomerang on the contractor? Professor Puerifoy, who presented the lucid analysis on tax depreciation in September, shows how it may affect costs as well as total price.*

"Crash" Location Program—*How West Virginia, after a slow start, has hired a dozen consultants and is locating 800 miles of new arterials in a single season, to bring contract work up to the line years sooner.*

And: *Watch for more on-the-scenes reports on how some states are doubling or tripling their road job awards this year.*

ROAD-BUILDING VETERAN PROVES

BEST EQUIPMENT, WELL MAINTAINED, PAYS OFF BEST

▲ MILLION-DOLLAR ARRAY of equipment like this takes $7,000,000 relocation job on U. S. 21 in stride. This is just one of the many highway and airport grading and paving projects in Frank Mashuda Company's long and successful history. Tires shown are wide-base 3-T Nylon Hard Rock Lug by Goodyear.

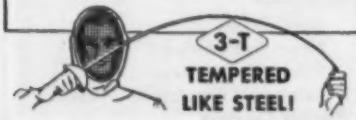
◀ TYPICAL ON-JOB SETUP includes huge Quonset maintenance center and 2-way radio facilities. All vehicles and tires are kept in A-1 working condition at all times, on every job—and when no longer needed are returned to central maintenance center for general inspection and reconditioning. This has paid off, through the years, in one of the lowest down-time overheads in the industry.

Tires move more yards for less

when built with Triple-Tough 3-T Nylon Cord!

ALL 3-T NYLON CORD—*Tubeless or Tube-Type*

HARD ROCK LUG | SURE-GRIP LUG | ALL-WEATHER EARTHMOVER



Like steel, tire cord must be *tempered* to be tough. Goodyear's exclusive 3-T process, involving Tension, Temperature and Time, *triple-tempers* cord to make it TRIPLE-TOUGH—to give you longer tire life, lower cost-per-mile.

Known as *"the greatest tire SAVER in 23 years,"* Triple-Tough 3-T Nylon Cord is a Goodyear exclusive.

During years of use, on the toughest jobs on earth, Goodyear 3-T Nylon Cord tires have literally saved *millions* for contractors and truckers who realize that the final cost of any tire depends entirely on *what they get out of it.*

The fact that more tons are hauled on Goodyear tires than on any other kind, certainly suggests that most operators get more yards-per-dollar, more miles-per-dollar, on Goodyears. If *you're* not already using Goodyear 3-T Nylon tires on your equipment, try them! Goodyear, Truck Tire Dept., Akron 16, Ohio.

Buy and Specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

All-Weather, Sure-Grip—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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No place for amateurs!

Pushing a "highway" to the sea, such as the St. Lawrence Seaway Project, calls for veteran construction men with modern skills and know-how.

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK continues, year after year, to keep pace with progress—providing all kinds of bonds and insurance—for all types of construction projects—in all parts of the world.

The Fidelity and Casualty Company of New York

"Writing Bonds Since 1876"

A Member Company of America Fore Loyalty Group

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ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 66 years of continuous publishing in the highway field; combined with Engineering and Contracting and Good Roads Magazines, established in 1892.

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CAT FUEL INJECTION EQUIPMENT CUTS COSTS BY PROVIDING MAXIMUM ENGINE PERFORMANCE

Presetting at factory for accurate performance eliminates field settings, makes installation of Caterpillar fuel injection pumps quick and simple.

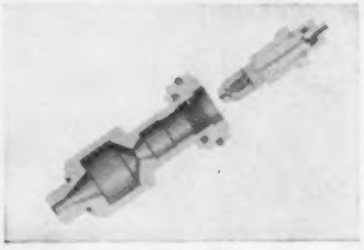
The fuel injection system is a key to peak engine performance. It must deliver to each cylinder equal amounts of fuel at precisely the right time. Deviation means a loss in horsepower. That's why it pays to use Cat fuel injection equipment.

Cat injection equipment can save you money in other ways, too. No field or operating adjustments are necessary. Installation is *quick and simple*. All pumps are interchangeable for different cylinders and between engines of the same model.

This interchangeability permits smaller parts inventories, makes replacement inexpensive by eliminating custom fitting, and makes replacement possible in a matter of *minutes* right on the job regardless of the experience of the mechanic.

Genuine Caterpillar injection equipment is built to last. With clean fuel, a life of 20,000 service meter hours is not unusual.

Pumps, plungers and barrels are manufactured from the finest chromium alloy, so hard that diamond dust is required for lapping the plungers and barrels. Pumps are tested and preset at the factory to provide accurate metering, timing and fuel pressure.



HIGHEST STANDARDS in the industry go into the manufacture of Caterpillar fuel injection equipment. Pump plungers and barrels, for example, are finished to tolerances so fine that the heat from your hand will expand a plunger enough to make it larger than the matching barrel.

SERVICE TIP

Your Caterpillar Dealer has the testing equipment to determine accurately when fuel injection systems parts should be replaced. And testing is the only sure way of knowing.

RUN-IN TESTS—four hours on pumps, two on valves—are conducted on these Caterpillar-built test machines before a pump or valve leaves the factory. Strict testing procedure means perfect performance of genuine Caterpillar injection parts.

Single-orifice fuel injection valves minimize the possibility of clogging or fouling. A spring-loaded plunger within the valve opens by fuel pressure at the proper time for uniform and precise injection. Extra protection is given by a fine-mesh screen. This clean, accurate injection means less down time and lowest fuel cost per unit of power.

Don't risk real damage to your Caterpillar equipment with an improperly functioning fuel injection system. Test systems regularly and replace worn parts with genuine Caterpillar parts. Your Caterpillar Dealer has the full story. See him today. And remember, he stands behind every part he sells.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Improper fuel injection equipment can be expensive. For instance, if a machine's owning and operating cost is $10 per hour, its total cost in a 2,000-hour season is $20,000. For a 200-horsepower machine that's $100 per horsepower. A poorly functioning fuel injection system which robs the machine of 5% of its horsepower (10 HP) could mean a season loss of $1,000 (10 [HP] x $100). Don't take chances. Standardize on Cat equipment.

CATERPILLAR

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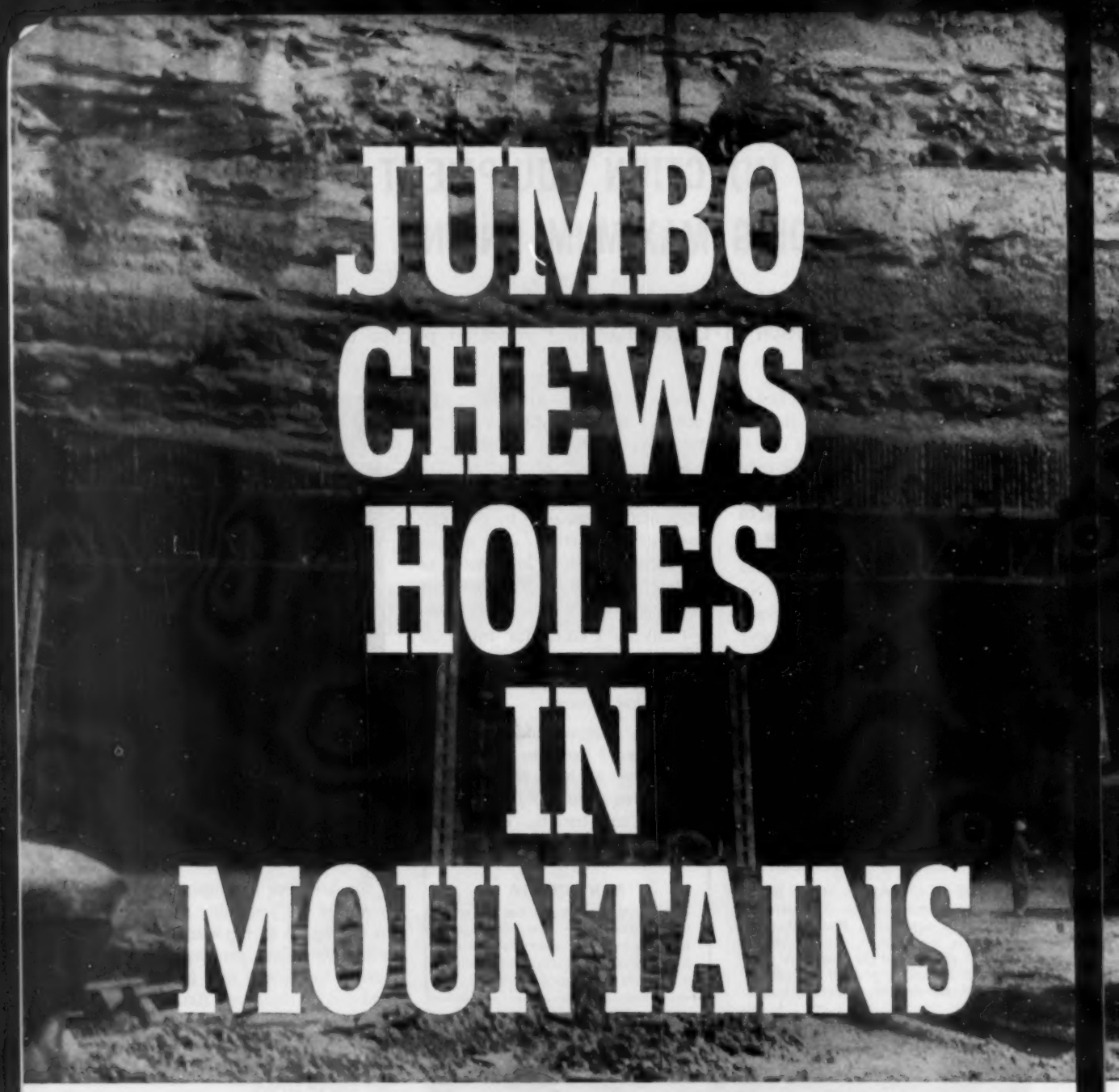


JUMBO CHEWS HOLES IN MOUNTAINS

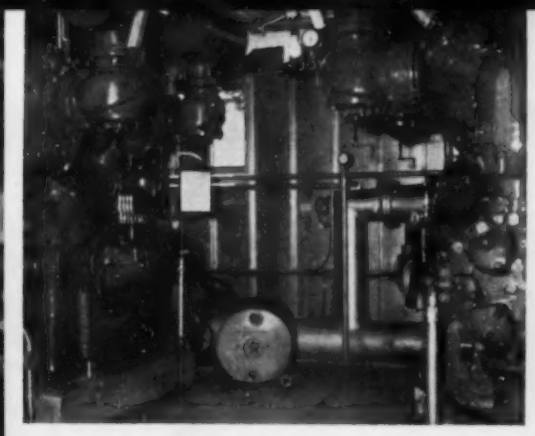
. . . with no unscheduled downtime, thanks to Texaco

This Jumbo drilling rig is Merritt-Chapman & Scott's solution to the Fort Pitt Tunnel Project, Pittsburgh.

Designed and built for the job by M-C&S, the Jumbo stands almost as high as a two-story house, mounts 12 pneumatic hammer drills capable of taking a 10-foot bite of solid rock. This truck-mounted drilling machine was designed to operate alternately in Fort Pitt Tunnel's twin tubes, each running 3,600 feet through solid rock.

This Jumbo is 100% Texaco Lubricated—and it hasn't had one minute of downtime due to lubrication. The reason for this fine performance is the combination of qualities in Texaco Rock Drill Lubricant EP: a highly refined mineral base with extra extreme-pressure and anti-corrosion properties. Texaco Rock Drill Lubricant EP protects against rust and wear even under the most severe conditions of load and moisture.

Texaco protects compressors, too. The two heavy-duty units that drive the Jumbo's drills are reliably protected against rust, sludge and foam by Texaco Regal Oil E R&O. This specially refined and fortified lubricant keeps discharge passages clear, keeps valves working properly and cuts wear to a minimum.



THESE ARE JUMBO'S "MUSCLES"—twin Joy air compressors, lubricated with Texaco Regal Oil E R&O to assure uninterrupted heavy duty performance.

THIS IS M-C&S' JUMBO—a 12-headed mobile drilling machine. Big solutions for big problems are typical of Merritt-Chapman & Scott—the company that built the 34-pier substructure of Michigan's miraculous Mackinac Bridge, longest suspension span in the world.

Proved performance like this has made Texaco the choice for lubrication of the whole Fort Pitt Tunnels Project. To find out how your operation can become more economical and more dependable, call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

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25 FEET per minute

with Parsons 150 Trenchliner

Whatever your work schedule calls for — drainage, irrigation, pipeline, or utility trenching — Parsons wheel-type 150 has plenty of capacity to fill the bill. This high-production trencher opens from 12 inches to 25 lineal feet of trench per minute — 16 to 26 inches wide, at any specified depth to 5¾ feet.

Accurate depth control

A hydraulic ram on vertical mast raises and lowers digging wheel with fractional-inch accuracy, maintains close grade tolerance at any depth. Another hydraulic ram tilts the mast, balances weight of wheel forward when traveling or trailer-loading. To handle a wide range of soil conditions, Parsons 150 has cast-steel buckets with self-sharpening, reversible "Tap-In" teeth — or quick-change gumbo buckets. Shiftable, reversible belt conveyor deposits spoil on either side of trench. Want to know more about the heavy-duty 150 Trenchliner? Your Parsons distributor has complete details. Call him today.

PARSONS COMPANY

NEWTON, IOWA • DIVISION OF KOEHRING CO.

19 FEET DEEP

with big 310 Trenchliner

If your work requires extra-deep trenches, check into Parsons big 310 Trenchliner. It opens from 5 inches to 20½ lineal feet of trench per minute — 24 to 60 inches wide at depths to 19 feet. On most jobs this 310 is used with just one heavy-duty boom. However, for extra-wide trenches the 310 as a dual-boom machine cuts up to 6 feet wide, at depths to 12 feet-10 inches. Other Parsons sizes range from a small, mobile model on rubber to "big-inch" and "middle-inch" wheel Trenchliners.

P800

CHECK PARSONS FOR TRENCH WIDTHS FROM 8 TO 72 INCHES . . . DEPTHS TO 19 FEET

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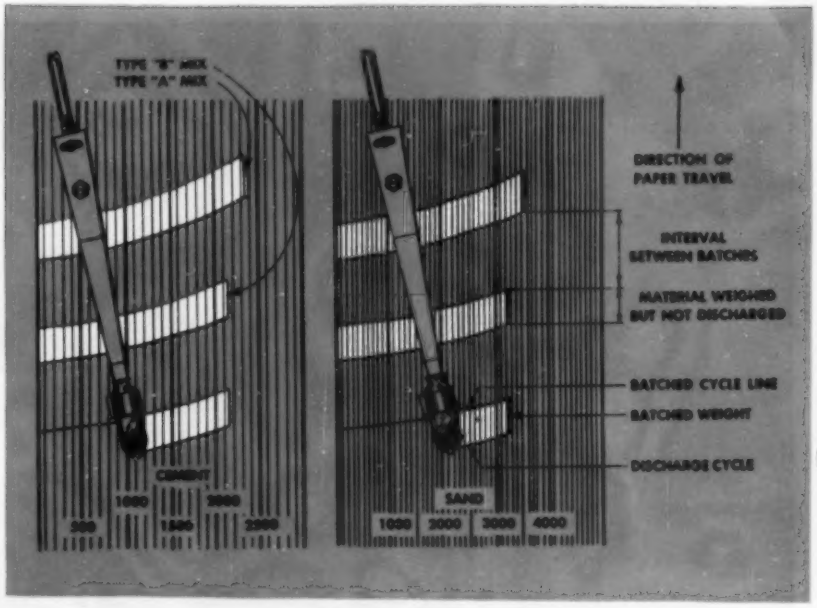
BE SURE OF

correct batch-weight *and record*

with Johnson graphic recording



Today's big-production paving jobs require precision weigh-batching of aggregates and cement to conform with rigid highway and airport specifications. For this reason, it's important that you have a complete and accurate record of every batch weighed out at the plant. With Johnson automatic plants, and graphic pen-recording, you're always *sure* of accurate batch-weight and record. Here's why. There is *direct transmission* of weight from each batcher to individual dial scale on the control cabinet. (A portion of a typical pen-recording is shown above.)

All on one record

No need to match up 4, 5, or more charts to check a batch — all materials are recorded on one roll. Pens are carried on ends of arms, rigidly attached to the dial-unit pendulum shafts. Pen lines provide a quick way to check material batch-weights. They show return-to-zero of each pen, and immediately indicate any material hang-up during batcher charge or discharge. The line of the curve *tells at a glance* that all mixes are correct, as specified.

No expensive, pre-printed charts are necessary. Plain white paper is used. Chart is printed on the paper just before it passes the battery of pens. This eliminates any chance of error, where pre-printed charts might stretch or shrink. Paper is driven by small electric motor from supply roll, past the chart-inking rolls and pens, to the windup roll.

Stamps time and date

Each time a batch is discharged, the year, month, day, and time of day to *the nearest minute* are automatically stamped on the chart. No record is complete without this time and date information. And that's not all —

Batch-sequence stamp

With Johnson graphic recording, a separate stamp registers batch sequence number on the chart. The batch number positively identifies each batch for a complete, *permanent* record. Sequence stamp can be re-set to zero each day.

Moisture compensation

Johnson system also has a moisture-compensating beam at the batch controller which automatically shows dry weight on the sand dial. No need to change the mix for variances in moisture. You just set up the mix for dry weight, and adjust the compensator to the correct moisture percentage from time to time as needed. Beam also can be used for fine aggregates. For detailed information, see Johnson distributor, or send for new 36-page text-book catalog. It explains all phases of paving plant operation.

Used extensively on dam construction and commercial ready-mix plants, Johnson *job-proved* Batch Controller also provides paving contractors with practical "push-button" plant operation.

Simply by turning a selector knob on the control cabinet, operator can switch from a pavement mix to a structures mix. Just a turn of the selector changes mix on *all* batchers simultaneously.

(While 7 or 12 different mix selections are usually sufficient, Johnson Batch Controller also can be arranged for 120 different mix selections—with a "repeater" for automatic accurate re-batching.)

C. S. JOHNSON COMPANY, Champaign, Ill.
Send free catalog on "Concrete Paving Plants"

NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY, STATE_____

Koehring Subsidiary J757—R & S

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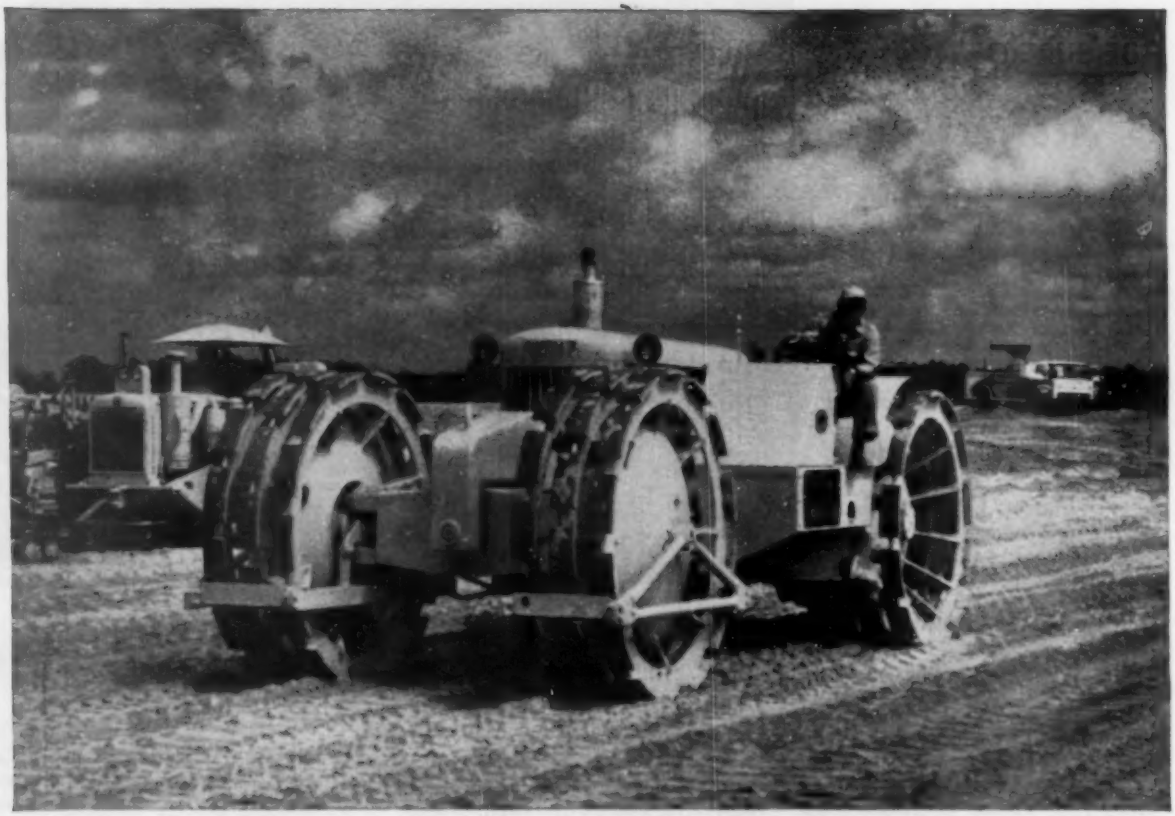

Hyde and Cook's K-45 Kompactor* boosts daily compaction on 10-million cu. yd. job!

Few contractors ever have the compaction problem that faced Hyde Construction Co. and Cook Construction Co. when they started a $4-million naval air station job in July, 1957. The joint-venture contract called for approximately 10-million cu. yds. of earthwork just north of Meridian, Miss.

First, density specifications were rigid. Second, the soil was wet and predominantly sand, with some clay.

*TRADEMARK

Third, the contract permitted 360 calendar days for completion, with $500-a-day penalty clause—and normally *only about 180 days a year can be worked in the area!*

With a vast array of conventional compaction equipment, the contractors were able to average 50,000 yards a day. This meant at least 200 working days would be required.

By mid-September, however, compaction had been increased to 65,000 yards a day—thanks, in a large part, to a Buffalo-Springfield® K-45 Kompactor roller put on the job.

Boosting production and meeting rigid specifications is nothing new for the self-propelled K-45 Kompactor . . . and here's why:

The K-45 operates on the "Interrupted Pressure Principle," which allows the machine to exert *all* its compaction effort *downward* . . . for uniform and maximum density . . . in the fewest possible passes. The K-45's staggered rows of heavy steel "pads" individually enter loose materials with a minimum of displacement either forward or sidewise . . . and then leave without disturbing the compacted areas in any way.

The Buffalo-Springfield K-45 Kompactor has proved itself as the top performer, the top money-maker for leading contractors throughout the country. Airfields, superhighways, military establishments—wherever the job is tough, specifications hard to meet and time short, you can count on the K-45 to do the job better . . . faster . . . *and at the lowest possible cost!*

See your Buffalo-Springfield Distributor today and get all the facts about the unusual Buffalo-Springfield K-45 Kompactor.

BUFFALO-SPRINGFIELD
Roller Division-Koehring Company
SPRINGFIELD, OHIO

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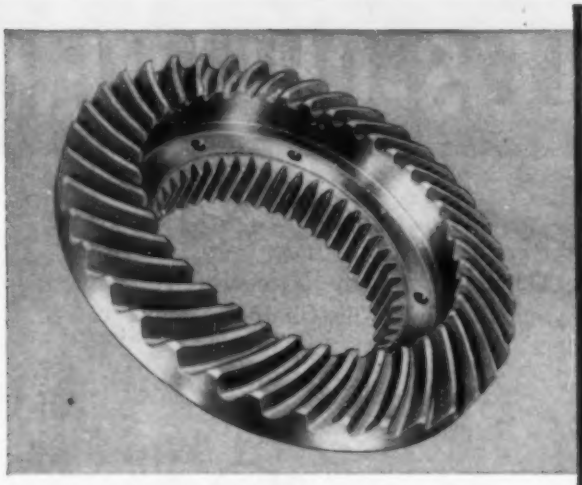
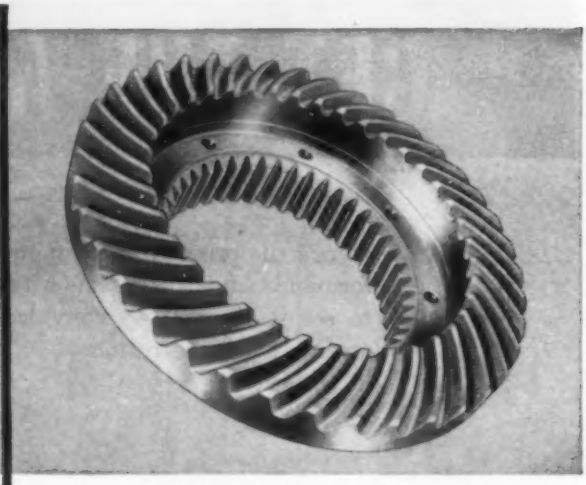
They May Look Alike . . . but they're Not!



Replacement Ring-Gear
Made by Eaton—Axle Division



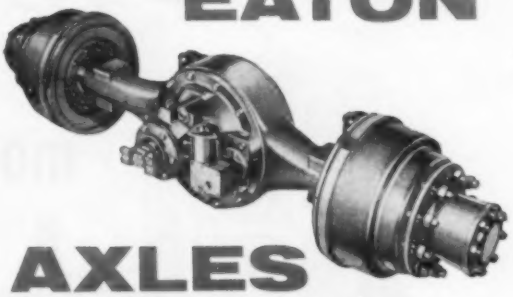
Replacement Ring-Gear
Not Made by Eaton

Only Genuine Eaton Axle Service Parts are Identical to the Original Production Components

Even Eaton Axle parts may wear out and require replacement. When this happens it is important that repairs be made with Genuine Eaton Axle Service Parts. They are identical to the original production components in design, metallurgy, heat treatment, and quality of finish—made to run together with the other axle parts. Eaton replacement parts are held to the rigid quality standards established for axle components and will deliver the same dependable, low-cost kind of service. So when, after thousands of miles of trouble-free operation, it may become necessary to replace worn parts in an Eaton Axle, it's most economical to make these replacements with Genuine Eaton Axle Service Parts.

MORE THAN TWO MILLION

EATON



AXLES

IN TRUCKS TODAY

EATON

AXLE DIVISION

MANUFACTURING COMPANY

CLEVELAND, OHIO

PRODUCTS: Engine Valves •Tappets •Hydraulic Valve Lifters •Valve Seat Inserts •Jet Engine Parts •Hydraulic Pumps Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioners Fastening Devices •Cold Drawn Steel •Stampings •Gears •Leaf and Coil Springs •Dynamatic Drives, Brakes, Dynamometers

. . . for more details circle 264 on enclosed return postal card

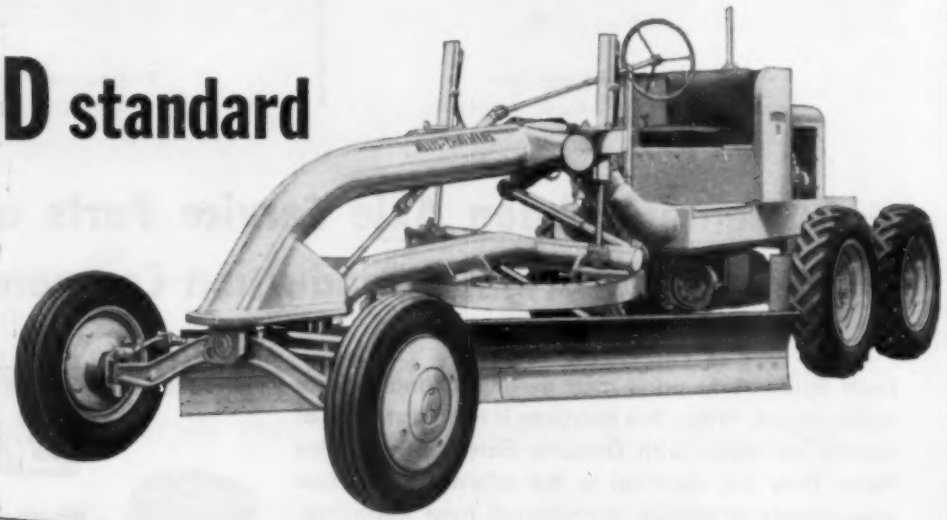
...for big economy on maintenance

GET THE ALLIS-CHALMERS

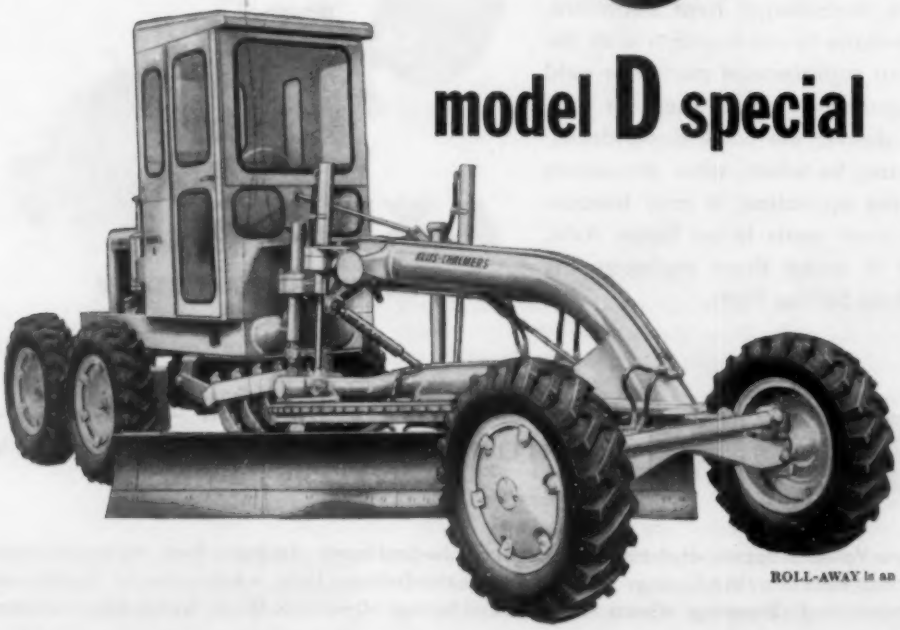
Here's the original low-cost motor grader with big-grader design and performance advantages. The Model D handles so many jobs so well, you have to see it at work to convince yourself. Your Allis-Chalmers dealer can arrange a demonstration.

model D standard

50 hp
Approx. weight
8,800 lb (gasoline)
Approx. weight
9,350 lb (diesel)



model D special



50 hp
Approx. weight
10,900 lb (gasoline)
Approx. weight
11,450 lb (diesel)
4 forward speeds to 25 mph (approx.)
1 reverse speed to 3 mph (approx.)
All-steel cab*
Shiftable moldboard*
Hydraulic scarifier*
Leaning front wheels*
Power circle turn*

*Also available with the model D standard as optional equipment.

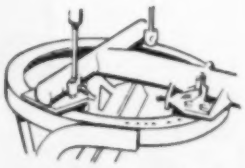
ROLL-AWAY is an Allis-Chalmers trademark.

and construction work

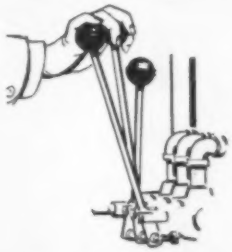
MODEL D MOTOR GRADER

many production-boosting advantages

The ROLL-AWAY moldboard rolls dirt up and ahead to eliminate packing, reducing friction . . . gives you more performance per horsepower, more production per gallon of fuel.



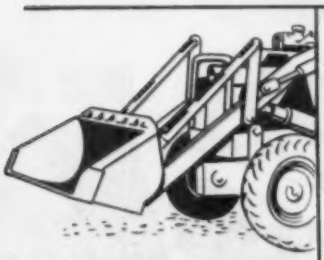
Revolving circle and heavy tubular drawbar provide exceptionally stable moldboard mounting.



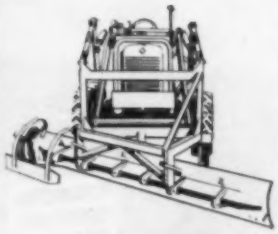
Convenient hydraulic controls, easy to operate. Two levers fit into one hand to control circle lift.

Positive tandem drive gives you four driving wheels under the heavy end of the grader.

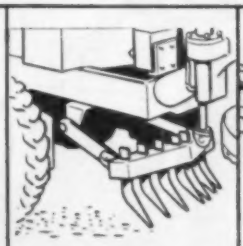
many job-multiplying attachments



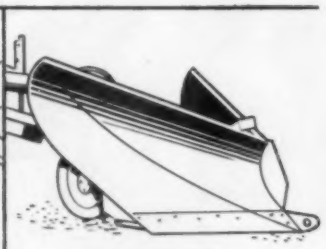
⅝-yd rear-mounted loader



Interchangeable shoulder maintainer



Midship-mounted scarifier



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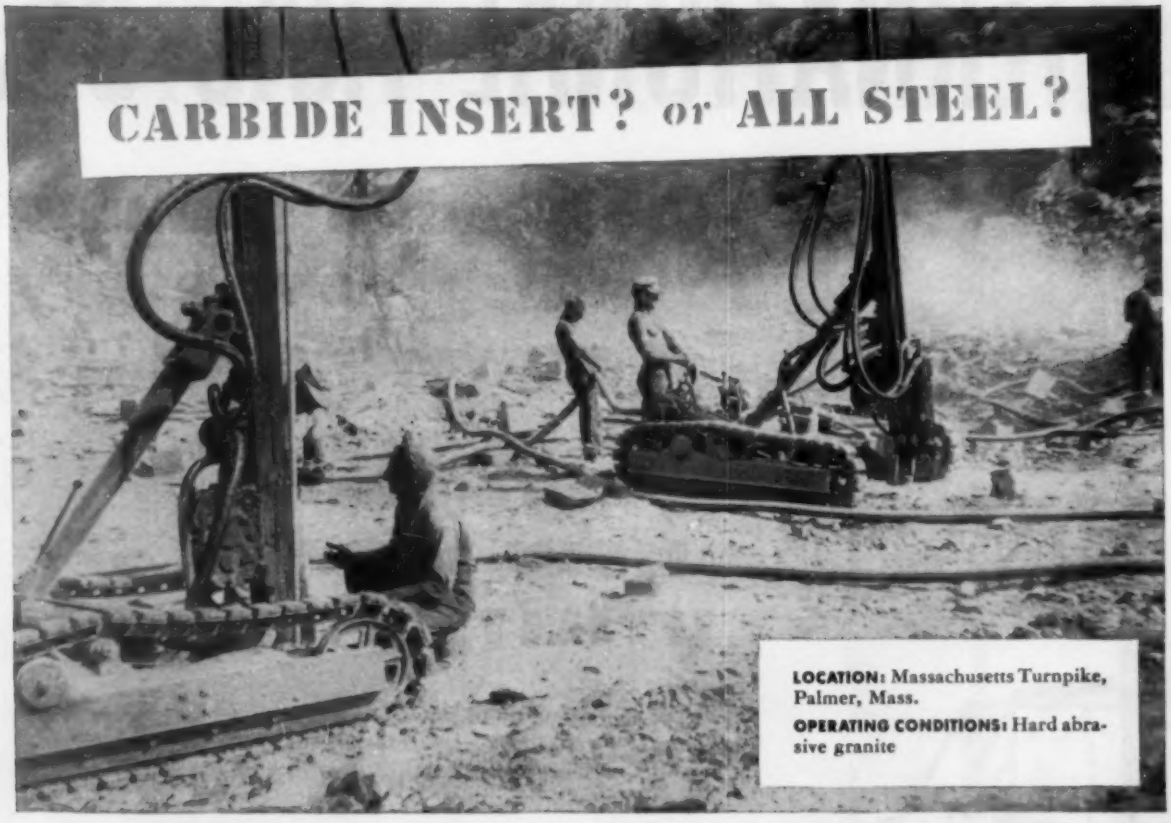
CARBIDE INSERT? or ALL STEEL?
LOCATION: Massachusetts Turnpike, Palmer, Mass.
OPERATING CONDITIONS: Hard abrasive granite

Grandview Construction Corporation sped deep hole drilling on Mass. Turnpike with Timken® carbide insert bits

GRANDVIEW Construction Corporation had to drill extremely deep holes through hard abrasive granite on its sections of the 123-mile Massachusetts Turnpike. To get speediest drilling at the most economical cost, Grandview used Timken® carbide insert bits. They got maximum production, kept bit cost per foot-of-hole at rock bottom.

For economical drilling in hard, abrasive ground, Timken carbide insert bits are your best bet. But carbide bits may not be the best choice for *every* job.

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Timken rock bits are made from electric furnace Timken fine alloy steel. We're America's only rock bit manufacturer that makes its own steel.

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Timken threaded all steel multi-use rock bit

Timken threaded carbide insert rock bit

your best bet for the best bit ...for <u>every</u> job

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ROADS AND STREETS
Sixty-Six Years of Editorial Leadership

Washington News Letter

Exclusive - By Duane L. Cronk, Director, Highway Information Services

October 10, 1958

The Congressional committee investigating construction costs on the 41,000-mile Interstate System recently was given evidence that competition is holding costs an average 5% under engineers' estimates.

A special check has revealed that in only three of 11 states investigated by the Government Accounting Office for Senator Albert Gore's Subcommittee on Roads are construction costs running over the highway departments' estimate. They are: Kansas (106%), Illinois (101%), and Washington (101%).

Ohio state engineers hit their construction costs "right on the nose" in their estimate. And in all seven of the other states, costs are 5-15% below early estimates. California (91%), Colorado (85%), Georgia (90%), New Jersey (95%), New York (91%), Texas (93%), and Virginia (94%).

The sampling represented $359 million worth of work, or 32% of the value of all Interstate projects in those states in the last two years. Alfred Johnson, executive secretary of the American Association of State Highway Officials, called it "conclusive evidence," first, that the states made sound estimates of their anticipated construction costs and, second, that the highway industry is not experiencing any run-away inflation.

* * *

Production-minded contractors will be interested in two "time-and-motion" studies released by the Bureau of Public Roads recently. One deals with the hourly cost of large crawler tractors; the other probes time-saving methods for 34-E dual drum pavers. Bureau engineers observed 27 110-140 hp tractors engaged in various tasks, noted their fuel consumption and other direct and indirect costs - repairs, taxes, insurance, shop overhead, depreciation, production labor and maintenance labor. The total per-hour cost ranged all the way from $6.24 per hour to $24.75.

The studies were made in five states over a total of 10,000 working hours. It was brought out that fringe benefits for operators amounted to about 28¢ per working hour of the tractor and that for each working hour of the equipment an additional 20 minutes was required in laboring time by operators and mechanics for maintenance chores.

Congress may be asked to boost the federal gasoline tax again next year, the Bureau of the Budget announced here last month. Director Maurice Stans claimed that by fiscal 1960 the Highway Trust Fund would be running "in the red" and a choice would have to be made between increasing highway user taxes or using general funds to make up the deficit. Revenues will be $900 million less than expenditures that year and the difference in fiscal 1961 would be $1 billion.

(continued on next page)

The historic problem which vehicle sizes and weights have posed for highway engineers may soon be extended to the airport designer. Noting the impending advent of jet transports, James T. Pyle, CAA administrator, told the Conference of U.S. Mayors last month: "We have reached the day when the users and the manufacturers (of planes) must agree on technical developments in order that we are not continually faced with requirements for longer and longer runways, more and more pavement."

The CAA has already specified the maximum length of runways on which it will participate with federal aid. As for pavement strengths, Mr. Pyle said, "We are in good shape for the Jet Age." Most pavements designed for large piston craft will be adequate for the jets and overlays can beef up any weak facilities. The federal officials re-affirmed the present administration's philosophy that local governments should assume more responsibility for airport construction. He urged the mayors to prepare up-to-date master plans to improve their airports in stages to serve jet transports.

(President Eisenhower vetoed last month a measure extending the National Airport Program for four years with substantially more federal aid. Congress wanted the volume of grants raised from $63 million annually to $100 million. The President disagreed, said that users should start paying more of the airport construction cost and that federal assistance should be gradually curtailed. A transitional program will be drafted for Congressional consideration in January.)

* * *

A research team will tie up this month a test which has asphalt and portland cement concrete interests watching with more than casual interest. It is a carefully constructed strip of asphaltic concrete runway, designed by Army Engineers to prove to the satisfaction of the Air Force whether asphalt can or cannot stand up under the nation's largest and heaviest bombing planes. A Congressional investigating committee, probing the controversial claims of asphalt and portland cement manufacturers and other experts, demanded another objective test of the material.

The research engineers are giving the test strip, at Columbus, Miss., Air Force Base, the equivalent of 5,000 B-52 landings and take-offs. The load which these planes exert on the pavement is 27 tons per wheel, or 266 psi. The asphalt vs. concrete controversy has been raging for years. Economy-minded Congressmen became concerned, however, when the Air Force specified exclusive use of portland cement concrete design in heavy runways and taxiways.

The Corps of Engineers has refused to modify its requirement for 80 ft. of clearance in bridges over the Atlantic Intracoastal Waterway. The decision hits a number of state highway departments which have been pressing for a lower standard, possibly 55ft., to cut their bridge construction costs. Maj. Gen. E. C. Itschner, chief of Army Engineers, suggested that semi-high, movable bridges might be a good alternate.

BPR officials report that such structures are not to be permitted on Interstate routes where highway traffic would be held up. The Corps will spend another year studying the problem, however, in hopes of determining a clearance which will be fair to both waterway and highway users.

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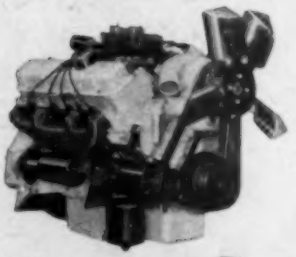
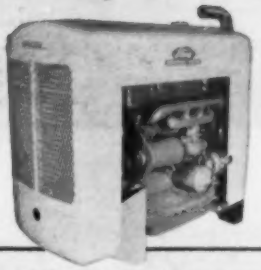
Also, there are now two Ford Diesels available—the Ford 220- and the new Ford 330-cubic inch Diesel. Write to us for the name of the Ford Industrial Power Headquarters nearest you.





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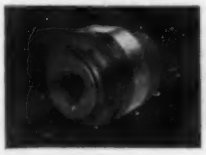
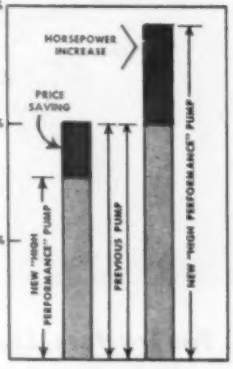


MORE HORSEPOWER PER DOLLAR

The graph at right makes a comparison between the new Series 35 "High Performance" Pump and a previous pump of the same delivery capacity. Note the substantial increase in maximum horsepower...over 40%! This power increase is accompanied by a price saving and by a package size reduction of almost one third!

This is the second unit released in the new complete line of "High Performance" Pumps (both single and double). The first (Series 25) is available in 12, 14, and 17 gpm sizes (at SAE rating of 1200 rpm and 100 psi). The three sizes offered in the new Series 35 pump are 21, 25, and 30 gpm. Characteristics are given in table.



Model Number	Delivery-GPM		Input Horsepower @ 2000 RPM 2000 PSI	Package Size†	Weight
	1200 RPM 100 PSI	2000 RPM 2000 PSI			
2V21A-**10	20.6	32.1	42.4	L. 6 1⅝₆" W. 5½" H. 6"	50 Lb.
2V25A-**10	24.5	38.0	49.8		
2V30A-**10	29.5	46.8	59.5		

†Exclusive of Shaft Extension and Mounting Lobes

8145

Write for new illustrated Bulletin No. M5108 for further details and performance characteristics.

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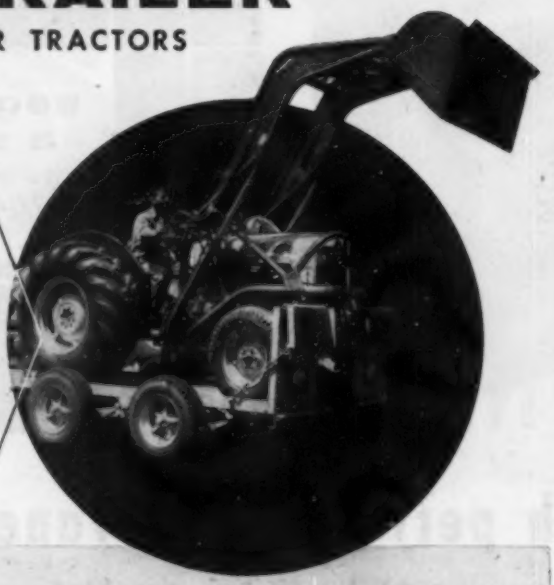

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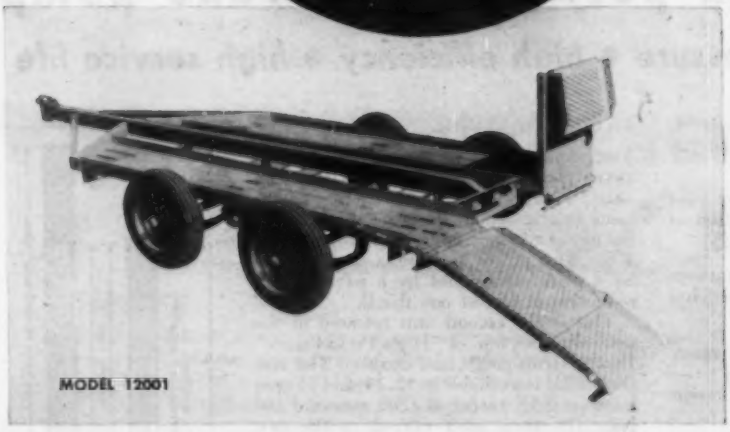

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Tighter Prequalification Considered in Michigan

The Michigan State Highway Industry Advisory Committee has recommended two changes in the department's requirements for road contractors. The committee, headed by James P. Dunnigan of East Lansing, in a recent meeting recommended:

(1) A change in prequalification requirements for contractors bidding on state highway work in excess of $25,000, which would require an affidavit of the contractor's assets from a certified public accountant, instead of from the contractor alone.

(2) That contracts awarded by the department require prime contractors to obtain performance bonds, which will make the bonding company liable for payments to subcontractors or suppliers six months after final delivery, instead of 60 days.

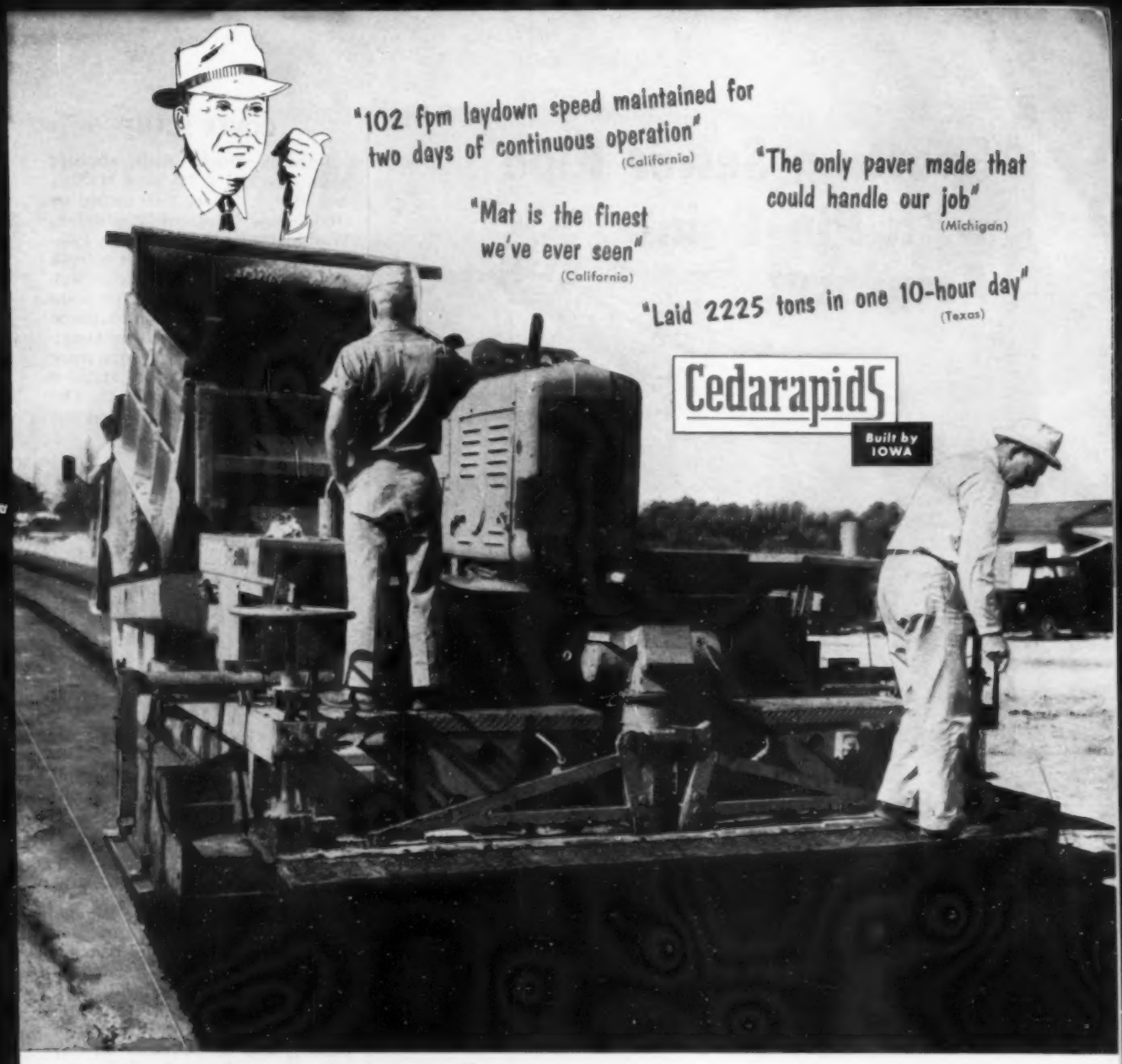
Dunnigan said the prequalification change will "tighten" requirements for bidders on state highway work and that the performance bond change would give suppliers and subcontractors better security for payment of money due them from prime contractors.

The Industry Advisory Committee members include: J. Gardner Martin, Lansing; L. Miner Doolen, East Lansing; F. Roland Sargent, Saginaw; John R. Snell, Haslett; Wilbur C. Wright, Williamston; Varnum B. Steinbaugh, Detroit; and Leet M. Denton, Gross Pointe.

The committee was appointed by Highway Commissioner John C. Mackie to advise the department on such matters as construction standards, prequalification of contractors, and questions relating to the capacity of state road builders to handle the greatly expanded road construction program now unfolding in Michigan.

The committee also works with the statutory, five-man Highway Advisory Board appointed by Commissioner Mackie, advising the board on a broad scope of policy questions pertaining to route locations, types of surfaces to be used on future construction, and numerous other matters.

● An average of 29.8 cents on the highway construction contract dollar has gone into pavements and 29.9 cents into structures, according to figures for 1950-1955 inclusive compiled by Ohio State University Engineering Experiment Station for Ohio road work in those years.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"The only paver made that could handle our job" (Michigan)
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These typical comments tell you why contractors prefer

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6407 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

Geared for Maximum Lifting Jobs

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A 8060-½-C

COVER SCENE

Loading trucks with abrasive granite rock is a 2½ yard Manitowoc Shovel, Model 3500 owned by Goodfellow Bros. of Wenatchee, Washington. This was a rush job—moving over 160,000 yards of rock alone in four month's time at Snoqualamie Pass, a Washington State Highway project. The Manitowoc 3500, one of two owned by Goodfellow Bros., loaded out an average of 1200 to 1300 cu. yd. of abrasive granite every 7½ hour shift. The Snoqualamie Pass job involved one mile of four lane highway.

Research on Lime Stabilization of Roads

Due to the growing use of lime in road base construction, the National Lime Association, Washington, D. C., has established a three-year research fellowship on lime in clay mineralogy at the University of Illinois, beginning in September, 1958. The fellowship involves a fundamental study of the reaction of hydrated lime with selected pure clays and clay-type soils. The key objective is to determine the mechanism behind lime's altering of soil properties. It is felt that this will lead to the development of a quick, simple test to determine lime's effectiveness with various soils. This type of test is needed by soils engineers concerned with base, subbase and subgrade stabilization. Another goal is the classification of soils according to their potential reaction with lime.

The research fellow will work under the direction of Dr. Ralph E. Grim, professor, Department of Geology and an authority on clay mineralogy. James L. Eades, research soils engineer on leave from the Virginia Department of Highways, will be the recipient of the fellowship.

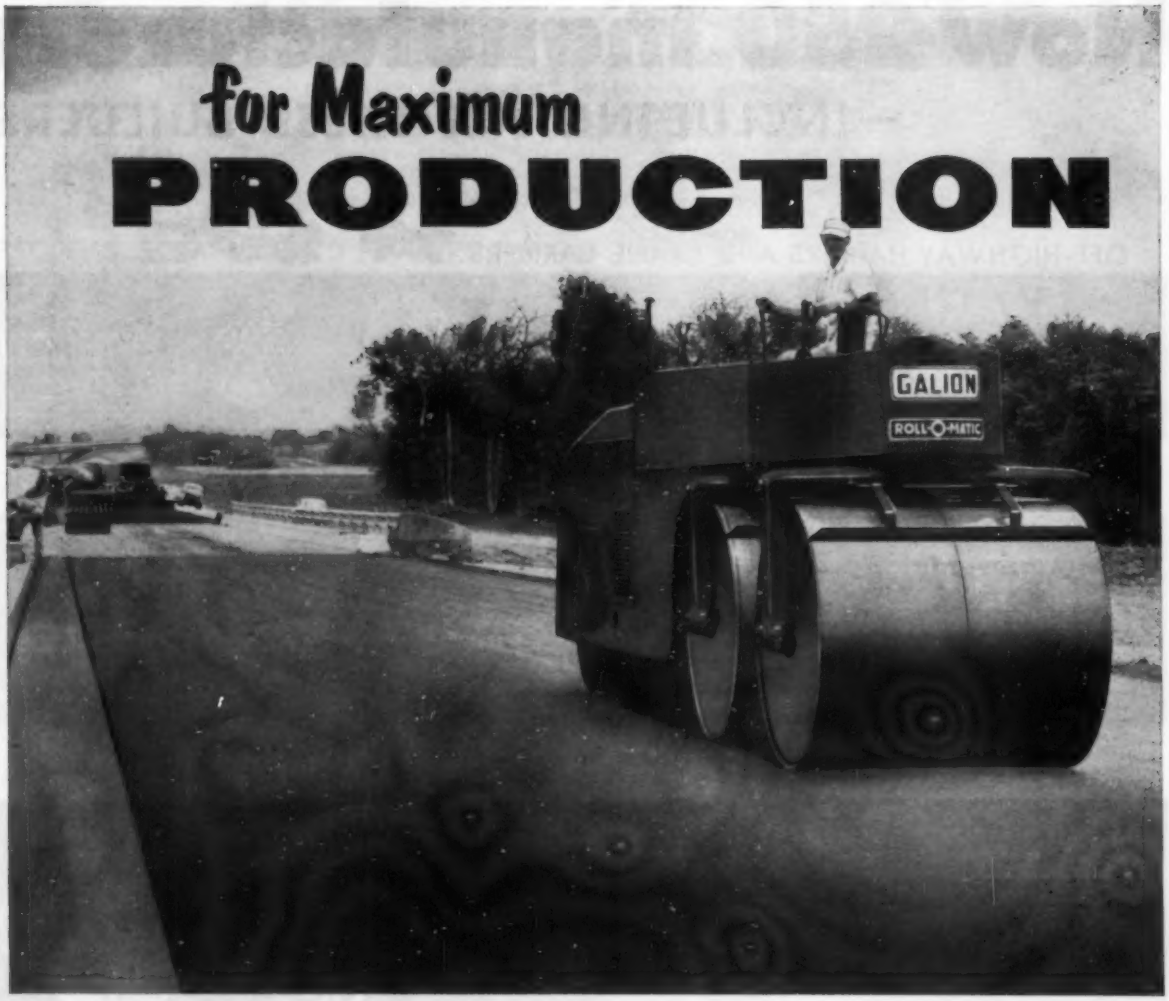
Reflectorized Edge Stripes

Edge striping with reflectorizing beads have been ordered by the New York Thruway Authority, for use in the current program of striping and related work.

Yellow paint will be used experimently in the Buffalo area, and elsewhere white reflectorized paint will be adopted.

The maintenance crews in each of the Thruway's four districts are using equipment to apply 47,000 gallons of paint and 235,000 pounds of reflective glass beads in the operation.

for Maximum PRODUCTION



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The Galion 14-20 Ton 3-Axle Tandem is designed to *concentrate* compaction on the high spots. It compacts up to 60% greater tonnage of material per day . . . and produces a 50% smoother finished surface than with ordinary rollers. No cross-rolling necessary. Simple and easy to operate. Write for literature.

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General and Export Offices — Galion, Ohio, U.S.A.

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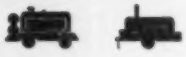

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Contractors generally agree that engine standardization pays big dividends. The wide use of GM Diesel engines in more different makes of equipment than any other Diesel provides unequalled opportunities for standardization—and the fact that GM Diesel covers the range from 30 to 893 H.P. with *only 3 cylinder sizes* results in highest parts interchangeability, lowest maintenance cost. Write for booklet, "STANDARDIZE YOUR POWER"—and learn the reasons why.

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IT PAYS TO STANDARDIZE ON...

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New Publications

HIGHWAY STATISTICS; 1956. 140 pages of data compiled annually by the Bureau of Public Roads. Available at Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C., Price, $1.00. Contains a wealth of data of interest to the highway and street planner or administrator.

Dust Around the Job

The Calcium Chloride Institute has published an Information Service Bulletin entitled "Eliminating Dust Around Construction."

It contains information regarding the advantages of laying dust. They are better public relations, safety to motorists, savings to contractor, reduction of complaints, and economies of construction and maintenance. The bulletin also lists areas where calcium chloride might be used, tells how to use the product and includes application charts for both types of calcium chloride and specifications for dust-laying.

The bulletin is available free on request to the Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C.

Looking for the best
MOWING POWER
. . . choose the engine performing best on rough, tough jobs

On your mowers as in the construction field, work done is measured in terms of dollars spent. And only one make of engines . . . Wisconsin Engines . . . offers you the two ingredients necessary to make every manhour a work hour. They are:

1. Quality construction . . . utmost dependability.
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FIRST CHOICE of professional construction men

WISCONSIN Heavy-Duty Air-Cooled ENGINES

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46 WISCONSIN

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A8-6209

Handbook of Accident Prevention (2nd Edition)

The National Safety Council has released the second edition of its "Handbook of Accident Prevention." The 93-page handbook on occupational safety contains such new material as a description of radioactive hazards and ways to protect against them.

The handbook, according to the Council, is writen for small businesses lacking full-time safety specialists. The handbook's style also makes it effective for use by key employees in small organizations. Further information on the handbook and quantity prices may be obtained from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

CORROSION OF REINFORCING STEEL AND REPAIR OF CONCRETE IN A MARINE ENVIRONMENT. Bulletin 182, Highway Research Board, 2101 Constitution Avenue, Washington, D. C. Price, $.80. Contains two papers given at the Board's recent annual meeting.

ARBA 1958 DIRECTORY OF HIGHWAY OFFICIALS AND ENGINEERS. New annual addition contains 1,700 names, titles and addresses of administrative engineers and officials in the highway departments, Bureau of Public Roads and toll road authorities. Price, $1.00 remitted to American Road Builders' Association, World Center Bldg., Washington 6, D.C.

CEMENT AND CONCRETE STP 205. Published by the American Society of Testing Materials, 1916 Race St., Philadelphia 3, Pennsylvania. 158 pages; hard cover; $4.00 per copy ($3.20 to A.S.T.M. members)

This volume includes papers on various subjects pertaining to cement and concrete, as presented during the Pacific Area National Meeting of A.S.T.M. in Los Angeles, Sept., 1956, under auspices of Committee-1 on cement and Committee C-9 on concrete and concrete aggregates.

STUDIES IN COMPOSITE DESIGN OF STEEL BEAM AND CONCRETE DECKS. Bulletin 174, Highway Research Board, 2101 Constitution Ave., Washington, D.C. Price $.80. Bulletin consists of two papers presented at the board's 36th annual meeting.

Time-light camera shows!

Which shovel-crane produces more ?

Follow the light lines. They show the "long reach" moves an operator makes with conventional controls to complete a hoe cycle, then shift from swing to travel, steer right and left and shift back from travel to swing. Such "arm's-length" work with slow mechanical or booster systems adds seconds to every move, drains operator strength, cuts end-of-the-shift output.

No reaching, no yanking . . . just easy, "keyboard" operation with Speed-o-Matic controls and Independent-Swing-and-Travel when performing the same operations as the hoe with conventional controls. Short-throw levers speed cycles, up output, conserve operator strength. Ask the man who has worked both controls. He'll pick Speed-o-Matic every time!

Speed-o-Matic power hydraulic controls increase output by decreasing cycle time and reducing operator fatigue

Pushing a shovel-crane at its highest limit all shift long is easy with Speed-o-Matic power-hydraulic controls.

And Speed-o-Matic—standard on all Link-Belt Speeder shovel-cranes—is the original fingertip, flick-of-the-wrist system.

Hydraulic pressure assures the same fast, smooth response *all day*, without adjustments . . . and with perfect feel of the load at every lever position.

And Speed-o-Matic power-hydraulic controls are only one of the many Link-Belt Speeder advantages. Others include—

- GREATER USABLE HORSEPOWER
- FULL-FUNCTION DESIGN tailors the machine to the job . . . permits more standard and optional features such as Independent-Swing-and-Travel.
- BONUS CRANE CAPACITY when using long booms at extended radii.

For complete details on why your best shovel-crane investment is a Link-Belt Speeder, contact your distributor or write LINK-BELT SPEEDER CORP., Dept. RS-258, Cedar Rapids, Iowa, for book 2553.

14,700

LINK-BELT SPEEDER

It's time to compare . . . with a Link-Belt Speeder

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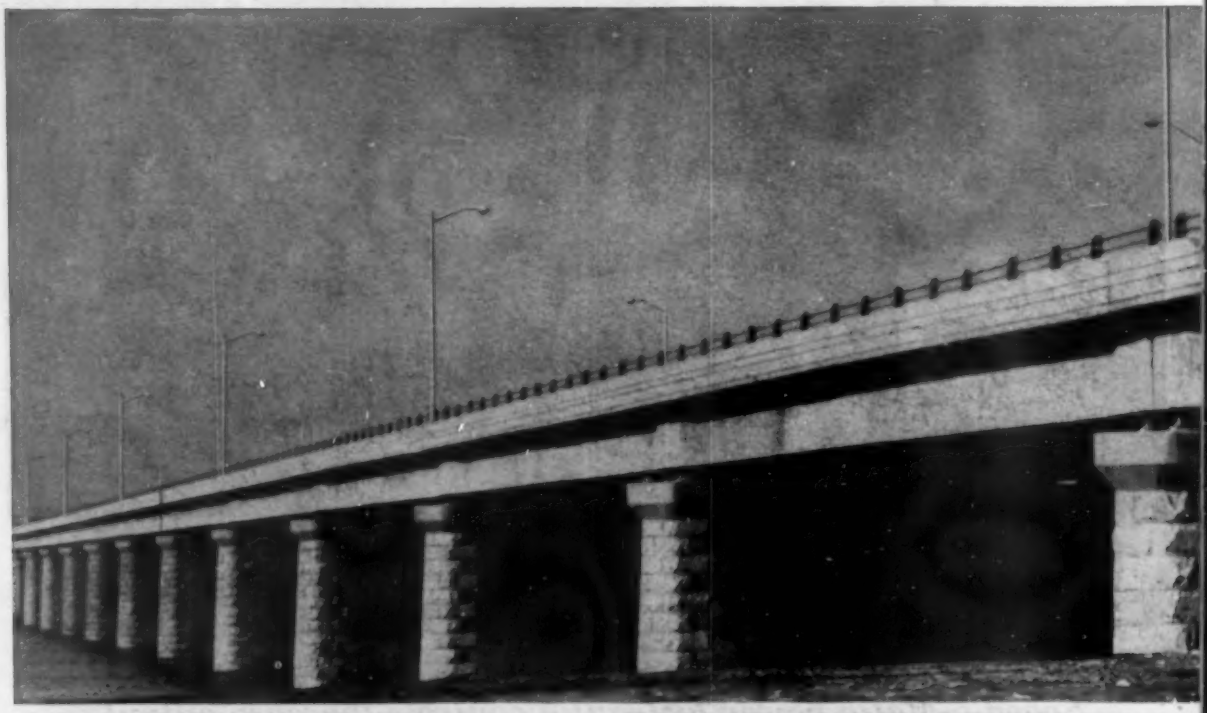
On the Wolcott Avenue Bridge

extraordinary straightness of new



Above—This is a partially completed reinforcing assembly for girders in the Wolcott Avenue Bridge. Super-Tens Wires have been inserted in six of the twelve flexible metal tubes in this particular assembly.

Left—This photo emphasizes the superior straightness of USS American Super-Tens Stress-Relieved Wire as it is uncoiled. It stays straight and lies flat, with no tendency to curl, which greatly simplifies handling.

USS American Stress-Relieved Wire solves on-site prestressing problem

Fabrication of prestressed concrete for the Wolcott Avenue Bridge was made much simpler through the use of *new* USS American Super-Tens Stress-Relieved Wire. Super-Tens is unusually *straight* prestressing wire. It stays straight . . . lies flat. This development has solved a major problem facing the manufacturer of prestressed concrete.

120-Foot Beams Prestressed Without Difficulty

The Wolcott Avenue Bridge, near Hartford, Connecticut, is a new cast-in-place, slab and girder bridge construction. It is built of concrete girders post-tensioned on the job with an amazing new product, USS American Super-Tens Stress-Relieved Wire.

This wire has straightness and handling ease never before realized in the field of prestressed concrete. New Super-Tens Stress-Relieved Wire developed by American Steel & Wire eliminates the tendency of wire to return to its original shape. This tendency has been a major problem in making up parallel-wire, post-tensioning assemblies. By using new, *straight* Super-Tens Stress-Relieved Wire, however, the builders of the Wolcott Avenue Bridge not only saved time on the prestressing operation, but did the job more efficiently.

Spans are 120 feet long; girder webs are seven feet deep and twelve inches wide. The Freyssinet post-tensioning system was used. Each cable contains twelve 0.276″ diameter USS American Super-Tens Stress-Relieved Wires.

Perfecting a straighter prestressing wire is the latest milestone for American Steel & Wire engineers, leaders in the application and development of steel wire and strand for prestressed concrete. If you are interested in prestressed concrete construction, get in touch with us today through our nearest Sales Office. Or write to American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

USS, American and Super-Tens are registered trademarks

These are the people who built this bridge:

Owner: The Greater Hartford Bridge Authority
General Contractor: Merritt-Chapman & Scott Corp., New York
Designing Engineer: Thomas Worcester, Inc., Boston
Supervising Engineer: DeLeuw, Cather & Brill, New York
Consulting Engineer for Contractor: The Preload Co., Inc., New York

American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

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Short-lived blades cut nothing but profits

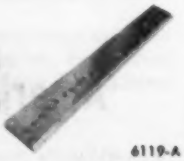
To earn their "keep", earthmoving machines must be *active*—ready at all times to get up and go. Blade failures reduce the most powerful units to idle hunks of expensive hardware, cause downtime that cuts into profits. Tough, long-wearing CF&I Cutting Edges provide the best protection you can buy . . . against blade changes, work stoppage, maintenance or replacement costs.

CF&I maintains a library of more than 4000 cutting edge blueprints. Available in a variety of curved or flat surfaces, rugged, dependable CF&I Cutting Edges are made of special analysis steel, produced exactly to specifications. When you use CF&I Cutting Edges, you get built-in endurance and resistance to wear that means fewer blade failures, less downtime, more profit per dollar of blade cost.

For complete details and prompt assistance, contact the CF&I sales office nearest you.

Cut Downtime WITH CF&I **CUTTING EDGES**

THE COLORADO FUEL AND IRON CORPORATION



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REO

No name in heavy hauling equipment merits more respect for reliable performance than Reo's rugged line of trucks. Every Reo is engineered to its specific job . . . custom built completely to it . . . and powered by the most advanced high-efficiency engines available—gas, LP-Gas and Diesel. This power is coupled to power train components of proven performance, assuring speed and agility under full loads. To reduce chassis weight, Reo's framework is engineered to provide the ultimate in strength with the lowest possible weight. **Additional allowable payload within legal limits is possible through Reo axle placement.** For information on Reo's complete tandem line, including special models for **transit mix, dump work** and **oil field service,** write for new model folder.

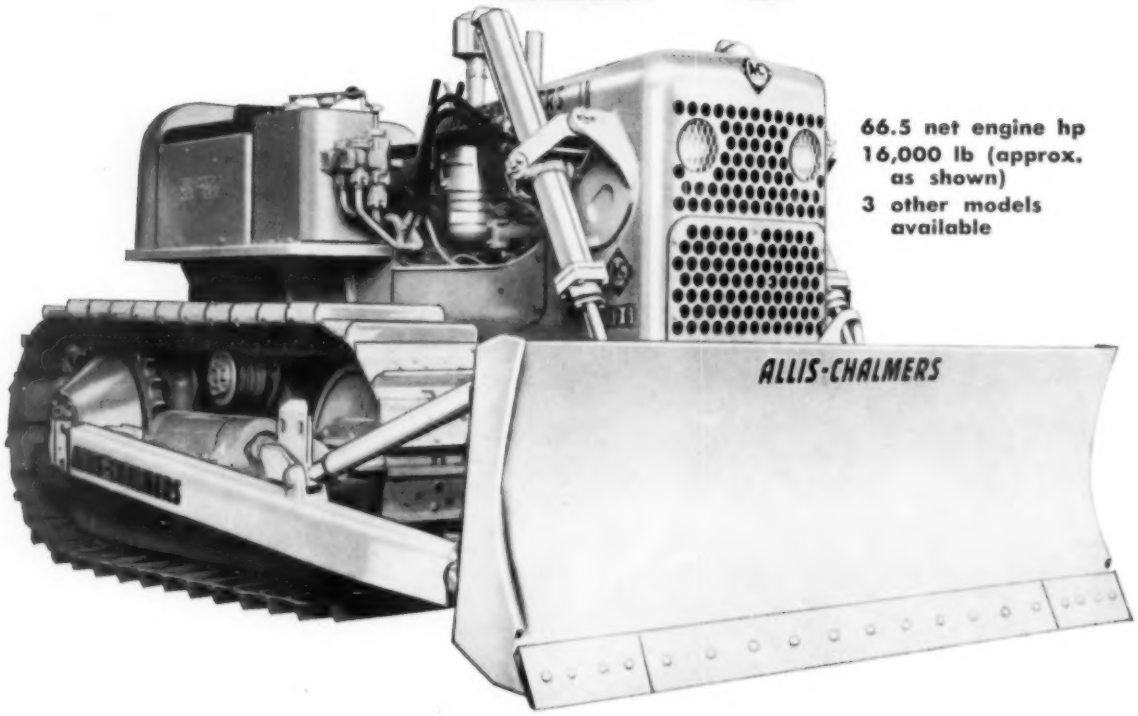
REO DIVISION, The White Motor Company, Lansing, Michigan.

GOLD STANDARD OF VALUES

POWER for the job

PORTABLE without a permit

ALLIS-CHALMERS HD-6 Dozer



66.5 net engine hp
16,000 lb (approx. as shown)
3 other models available

Contractors find the Allis-Chalmers HD-6 measures up — both in performance and easy transport. It has the size, power and dependability to make money on all your earthmoving jobs.

When traveling from job to job, there's no need to remove the dozer. The 8-ft. blade — legal width for highway travel — lets you load your HD-6 right onto a truck or trailer — travel quickly with no time lost.

The HD-6 is a maintenance man's tractor. Even in mud, sand, rock and dust, Allis-Chalmers Positive Seals protect tapered roller bearings on truck wheels, idlers and support rollers. These smooth-running assemblies require lubrication only once every 1,000 hours — change greasing time to profitable work time.

There are many reasons why more and more contractors are using HD-6 dozer tractors. See your Allis-Chalmers dealer. He'll be glad to demonstrate on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

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Doing Winter Dozing? Ways to Make Job Easier

(From LeTourneau-Westinghouse Company)

● **Rock is being spread here in really cold weather—using a LeTourneau-Westinghouse Tournatractor which combines rubber-tired mobility with pushing power.**

While winter time, with its twin problems of frozen material and uncomfortable working conditions, is a poor time to move dirt, there are some things you can do to make your work easier if you have to do it.

Basically, it is best to remember that with dozers we usually don't try to move frozen earth as such—that is, earth with 12 in. and deeper of frost. However, dozers can probably be used if the problem is opening a cut where frost is 2 in. to 8 in., or of keeping a job going where frost has formed over-night or over the week-end.

If your Tournatractor is equipped with down-pressure, your job will be a little easier. If you have only the bulldozer blade, however, you can still do a good job of dozing frozen or hard materials.

The bulldozer blade on the Tournatractor is adjustable a slight amount for penetration in frozen or hard material. The bowl is adjusted to a side tilt position with one corner lower than the other by loosening and tightening alternate nuts on the trunnion eye-bolts. To change the tilt, adjust the trunnion eye-bolts upward or downward an equal amount on both sides of the machine.

This will lower one corner of the blade and dig in the sharp dozer point. With all the Tournatractor power turned loose on the dozer corner, it digs into frozen earth and hard pan comparatively easy.

By going back and forth you will be able to work down through the frost line. Once through the frost line you can clear off a strip the width of the blade and the length that you are going to move. After you have done this, readjust your blade to the level position. Keep your blade just below the frozen ground, using one corner to widen the cut. Use the powerful lift of the blade to take out large chunks of frozen ground.

If you are using an angledozer on your Tournatractor the vertical tilting adjustments are located on either side arm.

Another way to get penetration with one corner of the blade without adjusting the tilt is to run one side of the Tournatractor up on a ridge, rail tie or log laid lengthwise in the direction you want to doze. This will lower one corner of the blade and you can proceed as outlined above.

211 New Mobile Radiotelephone Units

The Pennsylvania Turnpike Commission has authorized the General Electric Corporation to provide 211 two-way radio units at cost of $87,102. Each unit will cost $420. The radios will be installed in snow removal and maintenance equipment to provide communications with all 38 interchanges, 19 maintenance sheds, 8 tunnels, state police and authorized service equipment patrolling the turnpike.

Mobile Short-Wave Units for Turnpike Maintenance

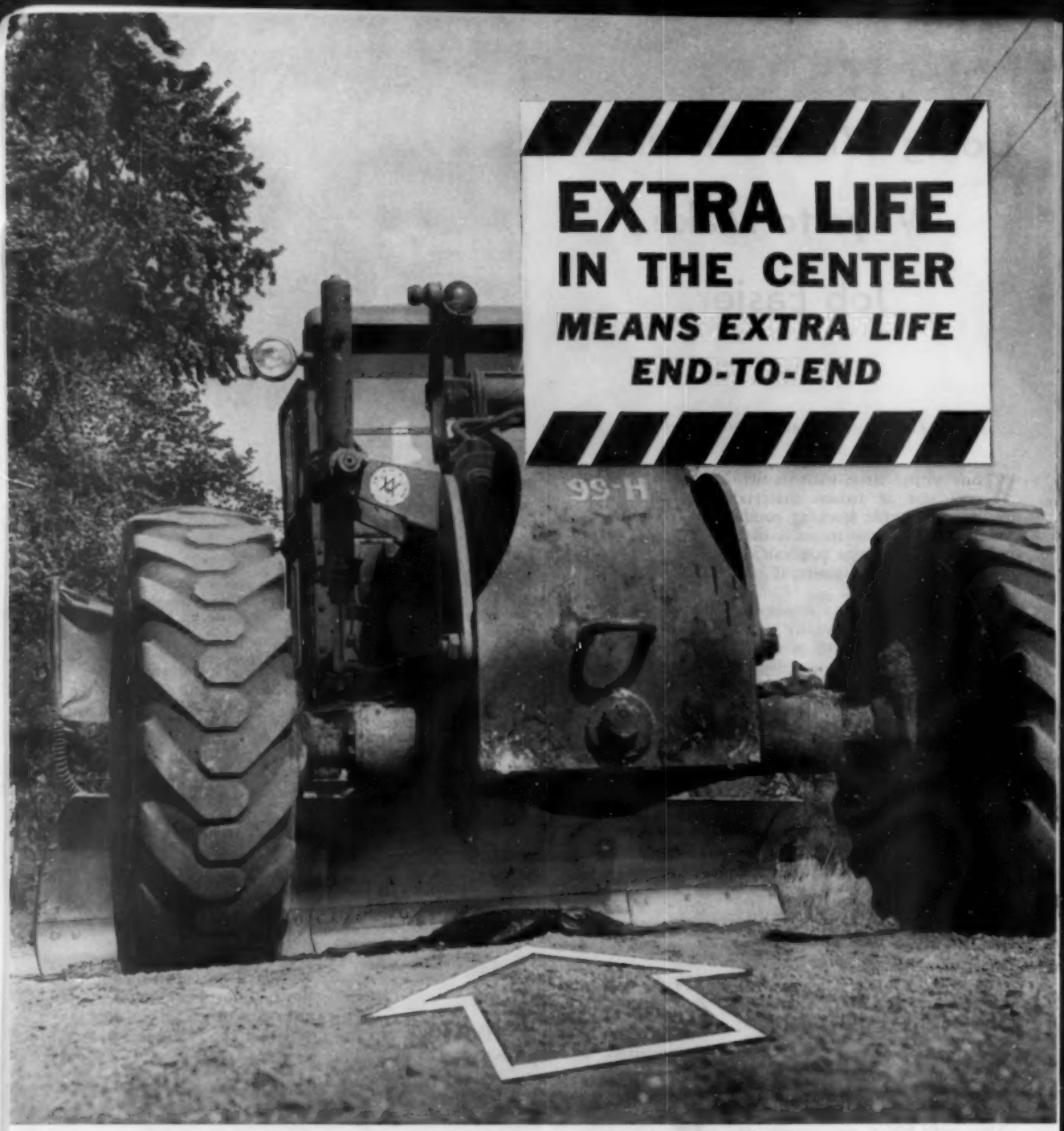
The Pennsylvania Turnpike Commission recently took bids for 211 two-way mobile short wave radios to be installed in all vehicles used in snow removal operations.

There are presently 256 mobile radio vehicles on the 470-mile toll road.

CUT YOUR BLADE COSTS 40% to 60%

Read the next 2 pages

Mail coupon on next page



PAPER, CALMENSON & CO., Department L
County Road B and Walnut St., St. Paul 13, Minnesota

Please send me additional information on savings to be made with Pacal 3-piece blade arrangement and quote me comparisons on sections I'm using now.

Number of graders_____ Length of mold boards_____

Size of blades in use_____ Type of work done_____

Name_____

Organization_____

Address_____

* NOW! More than ever it's important to use Pacal Heat Treated Plow Bolts. With the longer life of X-TRA-EDGE blades you need a bolt that has a head as hard as the blade. Pacal Heat Treated Bolts have triple strength . . . do not stretch or loosen.

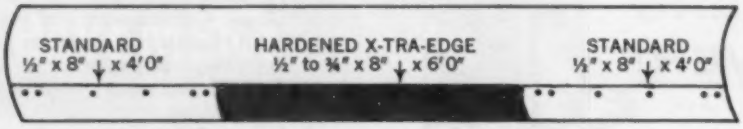
PACAL Announces New 3-piece grader blade arrangement with hardened X-TRA-EDGE

CUTS COSTS 40% TO 60%

CONQUERS EXCESS CROWNING

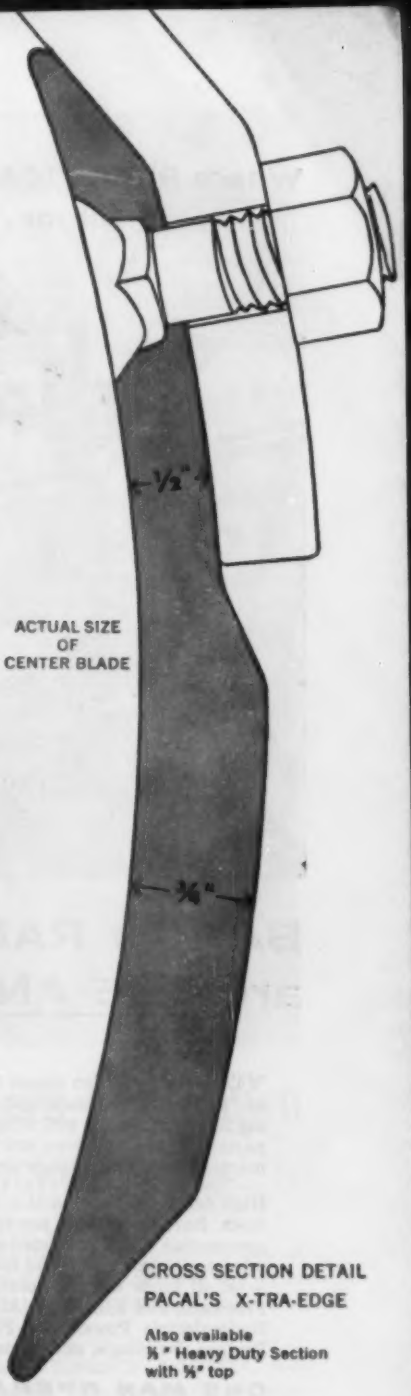
With Pacal's new 3-piece grader blade arrangement you get extra life in the wear-taking center section in 2 ways: 1. through the extra cutting-edge thickness of Pacal's X-tra-edge blade construction, 2. through the special hardening of the cutting-edge steel by heat treatment. Instead of two sections, you use three: a hardened X-tra-edge section in the center—shorter standard double-beveled blade sections at each end.

EXAMPLE: 14′ Mold Board



Pacal's new 3-piece, flush-joint blade arrangement is also available with ⅜" to ⅝" hardened X-TRA-EDGE center section and ½" standard blade sections at each end. Combinations for all mold board lengths.

Exhaustive operating tests over a period of 4 years have proved blade costs can be cut 40% to 60%. The new Pacal blade arrangement prevents excess crowning, keeps a sharper cutting edge, reduces end-gouging and other work slow-ups, makes your equipment and operators' time count for more in material moved and miles of smooth roadway completed. Much less down-time per year for blade changes—much less bolt cost* —much less blade cost. Get full information. Mail coupon today.



ACTUAL SIZE OF CENTER BLADE

CROSS SECTION DETAIL
PACAL'S X-TRA-EDGE

Also available
⅝" Heavy Duty Section
with ½" top

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Specialists in Making Steel Serve You Better

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County Road B and Walnut St., Adjoining Highway 36, St. Paul 13, Minnesota • Telephone: MIdway 6-9456
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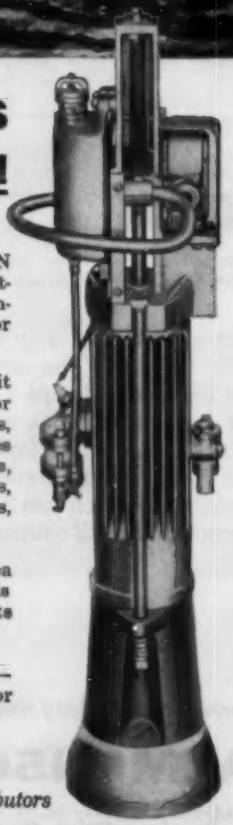
PACAL

Where SPECIFICATIONS call for . . . . .

HIGH DEGREE SOIL COMPACTION

BARCO RAMMERS are THE ANSWER!



YOU can't get *high degree* SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches —on all kinds of construction jobs: Toll Roads, Freeways, and Highways; Air and Missile Bases, Hydroelectric Power and Flood Control Dams, Bridges, Buildings, and Housing Developments.

ONE MAN OPERATION—On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On 18" trench backfill, using lifts up to 24", the rate is 360 to 600 feet per hour.

ASK FOR A DEMONSTRATION—We will be glad to arrange a demonstration for you; see our nearest distributor or write.

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BARCO MANUFACTURING CO.
5151 Hough Street • Barrington, Illinois

BARCO RAMMER *for High Degree Soil Compaction*
BARCO-VIBRA TAMP *for Granular Fill and Bituminous Surfacing*

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Personals

W. T. Brice

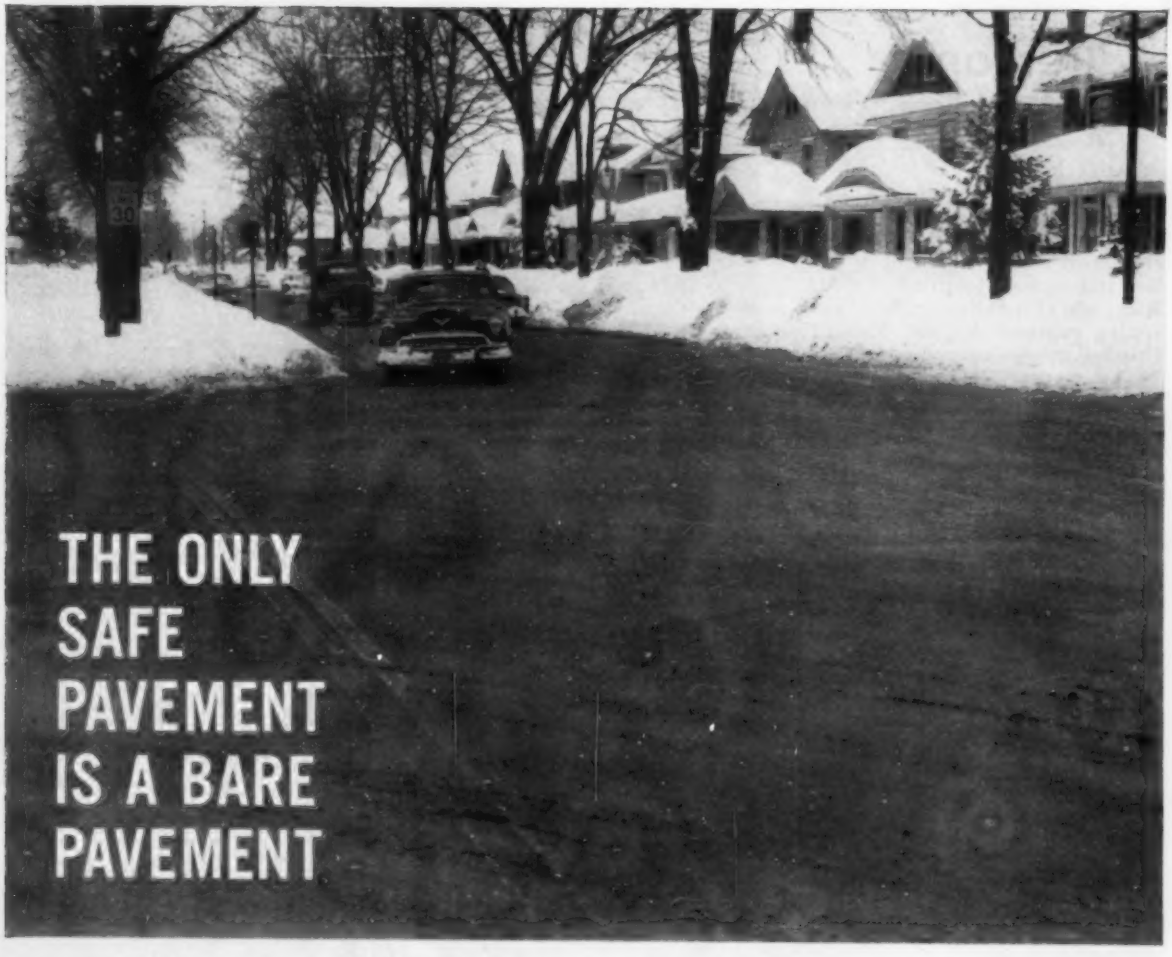
WILLIAM T. BRICE, former Executive Secretary of the West Virginia Road Commission, has been appointed Executive Secretary of the West Virginia Contractors Association. He succeeds the late P. J. "Mike" Walsh.

A former Wheeling newspaperman, Mr. Brice was with the Road Commission from 1943 to 1957, first as director of public relations and the last seven years as secretary.

M. J. BEVANDA, foremost figure in western U.S. in heavy engineering construction, died recently at Los Angeles, at age 70. Over a period of 40 years he was a participant with his late partner, Vincent Bressi, in such huge undertakings as Shasta Dam, Owens Tunnel Gorge and more recently in Trinity Dam Project now under construction, as well as numerous highway projects in the west.

ALLISON C. NEFF, vice president of Armco Drainage etc. Metal Products, Inc., Middletown, Ohio, died recently. He was a former board member and president of the National Society of Professional Engineers, and held other posts of responsibility and honor including a five-year term as president of the City Planning Commission of Middletown.

(continued on page 44)



. . . and only straight Sterling Rock Salt gets right down to the pavement through ice or hard-packed snow!

What's behind the big trend to straight rock salt for ice control? The answer is that abrasives—even when mixed with salt—just can't produce the bare pavements so vital during winter storms!

Sand and cinders don't melt hard-packed snow . . . have no effect on ice, sleet and freezing rain. They give very limited traction because wind and traffic quickly scatter them to the side of the road. And what's left is soon covered by as little as ¼" more snow. Cleanup of abrasives is a costly, messy job, too.

In contrast, straight Sterling Rock Salt is a powerful *melting* agent. It helps turn snow into slush—quickly. When ice forms, salt crystals bore through to the road surface. Here, brine is formed and spreads out to break the bond between ice and pavement. Ice can be easily removed so you get a bare, safe pavement.

Other economies. One truckload of straight Sterling Rock Salt covers as long a stretch of road as 8 truckloads of abrasives. You make fewer trips to take care of a storm. And Sterling Rock Salt leaves *no* spring cleanup jobs. Now's the time to complete your stockpiling of Sterling Rock Salt. Winter demands can make deliveries uncertain. Contact your International representative or the nearest sales office.

FREE "BARE PAVEMENT MAINTENANCE" BOOKLET. Ask your International representative or write for your copy soon. It's an up-to-date, comprehensive guidebook on all aspects of ice control. Can be helpful in your winter program . . . whether it's municipal, county or state.

INTERNATIONAL SALT CO., INC., SCRANTON, PA.

SALES OFFICES:

Atlanta, Ga.	Chicago, Ill.	Memphis, Tenn.	Philadelphia, Pa.
Baltimore, Md.	Cincinnati, O.	Newark, N. J.	Pittsburgh, Pa.
Boston, Mass.	Cleveland, O.	New Orleans, La.	Richmond, Va.
Buffalo, N. Y.	Detroit, Mich.	New York, N. Y.	St. Louis, Mo.

STERLING "Auger-Action" ROCK SALT

INTERNATIONAL SALT COMPANY, INC.

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Personals

(Continued from page 42)

JAMES M. RICE has been made director of the Natural Rubber Bureau's Research Laboratory in Washington. This facility specializes in the development of rubber and asphalt for road use. Mr. Rice was formerly research and testing engineer for the National Crushed Stone Association.

FRANCIS L. BROWN, formerly Deputy Superintendent of Public Works for New York State, and senior partner of Brown and Blauvelt has announced the continuation of his 20 years of professional engineering practice as Brown Engineers and Brown Engineers International, Architects, Engineers and Planners with headquarters at 60 West 55th St., New York, New York.

ARNO T. LENZ of the civil engineering staff of the University of Wisconsin, has been chosen chairman of the civil engineering department. He succeeds James G. Woodburn who continues in teaching and research.

Robert L. Smith

Robert L. Smith of ARBA Public Relations Dies

Robert L. Smith, public relations director of American Road Builders Association in Washington for the past five years, died recently. He had figured in the editing of the ARBA's magazine, now called The *American Road Builder*, and was editor of the ARBA *Newsletter*. Smith's background included 10 years as a special aid in U.S. House and Senate service, serving much of this time as research and press relations assistant to former Senator James M. Mead of New York.

EARL G. ANGELL is appointed district engineer for the Asphalt Institute for Minnesota and Iowa with headquarters in St. Paul. He has served the Minnesota department of highways in various capacities.

"Highway open for traffic while detour is being repaired." So announced the radio the other morning in a western city. We're glad to know that the public got through, one way or another.

ALLISON D. HILL, for 26 years with the Kansas highway commission, has been appointed district engineer for the Asphalt Institute at Springfield, Illinois.

STEPHEN K. JONES, head of S. K. Jones Construction Company, Memphis, Tennessee, died recently at the age of 86. He was actively in charge of his company until his death. His firm was a large-scale builder of Mississippi River levees and prominent in highway work.

"RAM" EATS SNOW—*fast!*

Ram Rotary Snow Plow with "PAYLOADER" Tractor at work last January in Waukegan, Ill. The Ram loaded 10-yard trucks in less than 60 seconds each. Downtown streets were cleared overnight after a 2 day blizzard with 3 to 4 foot drifts which paralyzed traffic.

Ask your "PAYLOADER" Distributor—or write direct to us for literature

RAM EQUIPMENT CO., INC. 5203 West Broadway Minneapolis 27, Minnesota

• Wet or dry . . . light, packed or icy . . . the "Ram" Rotary Snow Plow on a "PAYLOADER" Tractor loads a 10-yd. truck under 60 seconds—keeps 9 trucks busy.

It's fascinating to watch a Ram Rotary Snow Plow with a "PAYLOADER" Tractor walk steadily along the street and literally eat up the snow. Wind packed drifts or hard, icy piles, it makes no difference—and the Ram *positively will not clog* with wet snow. For clearing city streets it keeps a fleet of trucks on the dead run. For highway clearing it blows snow sideways up to 100 feet. You can't jam a Ram—it's a glutton for snow.

The Ram Rotary Snow Plow is a husky front mounted, independently powered unit, interchangeable with buckets on the "PAYLOADER" Tractor, equipped with stack for truck loading or blowing snow up to 100 feet. Adjustable skids, replaceable cutting edge, safety shear pins throughout. Built in 3 sizes, it's a rugged power packed unit proven by years of use.

"You're Right with a RAM"

★ ROTARY SNOW PLOWS
★ BLACKTOP SPREADERS
★ STREET SWEEPERS
★ LEAF MACHINES

Designed especially for the "PAYLOADER" Tractor. Sold by all "PAYLOADER" Tractor Distributors.

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PROVED AND PREFERRED...

Timken-Detroit® Axles are the Accepted Standard!

Timken-Detroit Heavy-Duty Tandems Are First Choice With Big Off-Highway Operators!

These superior features make the difference:

"Cradle Ride" Suspension. Free ends of long, resilient springs float in axle spring guide brackets. This permits axles to articulate freely, compensating for road irregularities. Floating springs cradle the vehicle, materially reducing road shock and eliminating source of vehicle flutter. *The load is more stable . . . driving is easier, more restful, safer.*

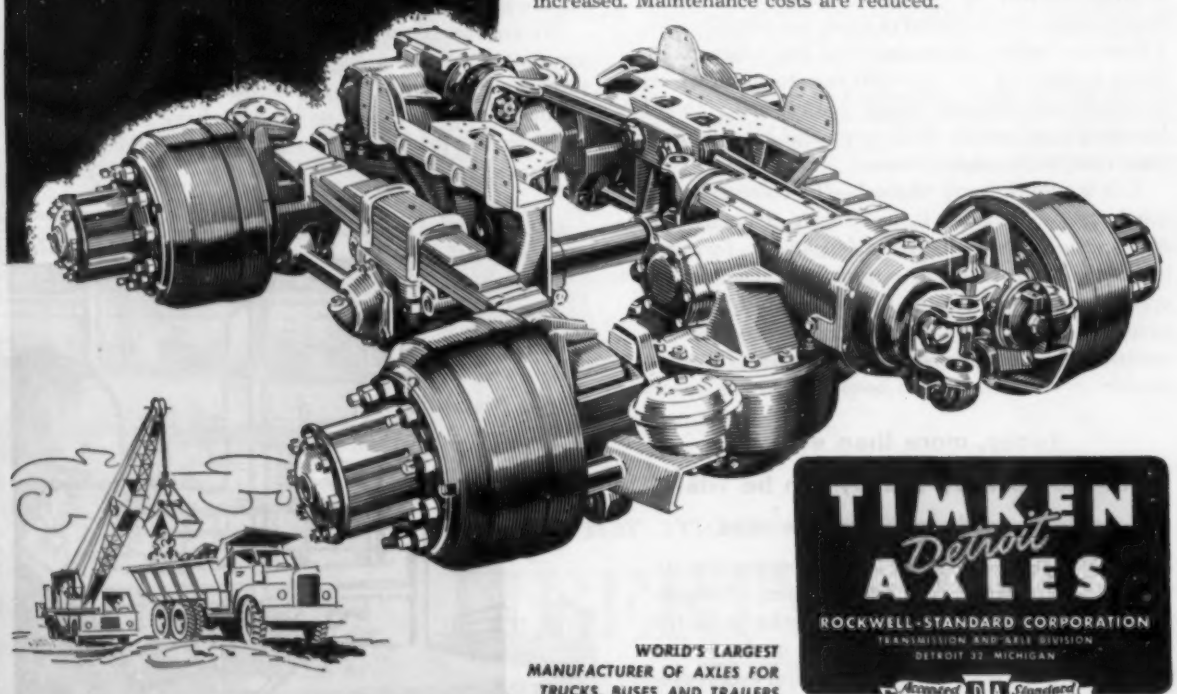
Hypoid Gears. Larger pinions and greater tooth contact give 30% more torque capacity, top efficiency and long life . . . *plus lower maintenance costs.*

Driver Controlled Inter-Axle Differential. Torque is divided equally between axles, yet wheels of one axle can turn faster or slower than wheels of other axle. This means both axles are always doing equal amounts of work. *Driving parts and tires last longer.*

Hot Forged Rectangular-Shaped Axle Housings. Rectangular shape, combined with full strength corner sections, provides the greatest strength with minimum weight and size. Welded-on bowl cover prevents leakage.

Torsion Flow Axle Shafts. More splines, plus greater root and body diameter, add extra strength.

Straight-Line Through Drive. Straight through drive eliminates all prop shaft angularity. Bearing and gear life is materially increased. Maintenance costs are reduced.



WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSES AND TRAILERS

TIMKEN Detroit AXLES
ROCKWELL-STANDARD CORPORATION
TRANSMISSION AND AXLE DIVISION
DETROIT 32, MICHIGAN
The Accepted Standard

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Products of **ROCKWELL-STANDARD** Corporation

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From Liberty Mutual: a concept of workmen's compensation coverage for today's economic conditions which provides

Protection in

—and how it cuts excess dollars from compensation insurance costs

The business-insurance rates you pay are, in the long run, determined by you

In today's business climate, it's more important than ever for you to keep your expenses down. If you have a large number of accidents, however, or suffer heavy losses over a period of time, you actually contribute to higher insurance rates for yourself. By doing everything you can *right now* to cut down on accidents and eliminate losses, you can help toward lowering your rates *in the future*—and help improve your company's profit picture.

This is why Liberty Mutual – the company with the largest experience in workmen's compensation insurance – has over the years developed a forward-looking concept of business insurance which gives you protection in depth. From the start of your coverage with Liberty, a broad range of skills and resources can be put to work to anticipate and avoid trouble on your jobs and to keep future costs down.

Today, more than ever, *PROTECTION IN DEPTH* can be vital to the growth of your business

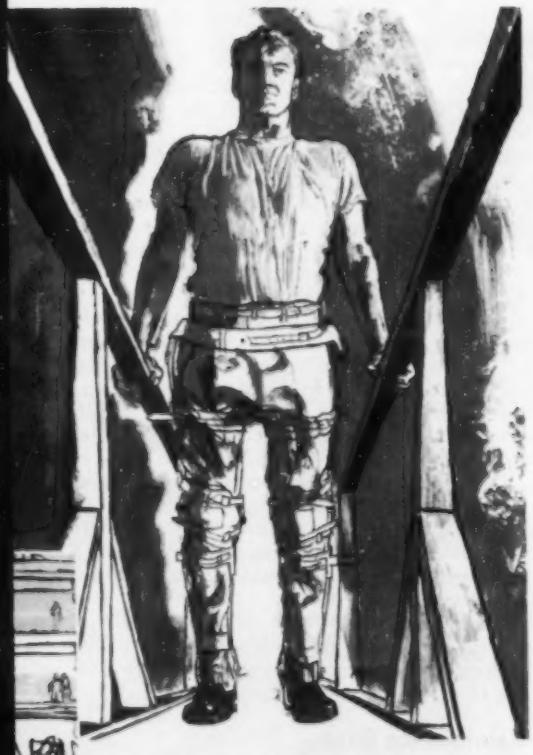
With competition so strong in the construction industry, it is apparent that the vigorous, efficiently managed companies will become the industry leaders of tomorrow. The protection in depth you get from Liberty not only helps you trim excess dollars from your insurance costs, but does it without sacrificing any of the coverage you need to safeguard your company during its growth.

Protection in depth has already helped Liberty establish an impressive cost-cutting record and a record for consistently attracting "blue-chip" accounts. Because we deal directly, our salesmen know their business—and yours. With the vast experience of the company behind them, they can competently handle unusual problems in all fields.

We encourage you to take steps to improve your insurance cost picture by becoming acquainted with protection in depth now. (You should also know about our dividends: since 1912, we have returned more than $455 million to reduce policyholders' insurance costs.)

depth

World-wide trouble shooter. A Liberty engineer goes wherever you have a job. With offices spotted throughout the U.S., fast, experienced help is always nearby. Liberty engineers have provided assistance even as far away as the Philippines and Greenland.



Learning to walk...the second time. The facilities of Liberty's two rehabilitation centers are available to badly injured employees of policyholders. Through therapy and prosthetics, patients help themselves recover, get back on the job.

Behind *PROTECTION IN DEPTH* is the broad range of Liberty's special skills and resources

Liberty's special resources are sometimes unique, often broader in scope than most other companies or agencies can offer. Many are routine and offered as a standard part of our work. Others are ready to crack dangerous or money-wasting problems policyholders may have. Here are a few of them and how they can be put to work for you in a program that gives real protection in depth.

An 86-acre, loss-prevention research center. Here chemists, physicists and radiation experts work on extra-tough problems such as: When does worker fatigue begin to affect a man's efficiency? How can the "safe" amount of dynamite be predetermined for blasting in a particular locale?

A medical advisory service. Liberty retains top orthopedic surgeons in key areas to check diagnoses of serious injuries, advise attending physicians.

These Liberty "extras," and the others shown on these pages, all work to give you the best possible protection in depth. All are available to any policyholder who needs them. All of them can work with you to lower insurance costs.

Keeping danger in check. Liberty's construction engineers conduct advance analysis of your jobs, look for accident hazards and ways to improve operating procedures. Guidance is offered on falsework design, materials handling, traffic plans, etc.

Look for more from

LIBERTY MUTUAL

...the company that stands by you

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY • Home Office: Boston
Insurance for: Automobiles, Liability, Group Accident and Health, Fire, Workmen's Compensation, Marine, Crime

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Snow Removal a Problem?

Think of **FRINK**

Specialists Since 1921 in

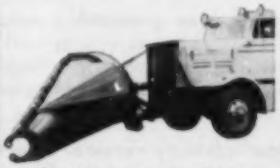
SNOW PLOW KNOW-HOW

Since the first steel plow (a Frink) hit the highway 36 years ago, every major advance in snow plow design and performance has been a product of Frink "know-how." Today there are four basic types of Frink Sno-Plows, each with models to fit trucks from 1½ to 12 tons, and most are interchangeable on the same attachment.

Whatever your area's snow removal problem, Frink makes THE plow best equipped to do the job faster, safer and at lower operational cost for plow **and truck.**

Learn all the facts and reasons why so many cities, towns, counties and states specify Frink Sno-Plows. See your distributor or write to Frink for descriptive folders about these plows.

V-TYPE SNO-PLOW
—rugged powerhouse for high-speed, heavy-duty highway work; leveling wings optional.



ROLL-OVER with Taper Blade
—for airports, expressways; rotates left or right in seconds; ends "dead-heading."

ONE-WAY with Trip Blade
—for high-speed throwing and spreading, but windrows neatly at city speed.

REVERSIBLE Trip Blade
—all-purpose; plows left, right, bulldozes ahead; power reverse lever in cab.

For Snow Plow Know-How It Pays to Think of FRINK SNO-PLOWS

Clayton, 1000 Islands, N. Y.
Frink Sno-Plows of Canada, Ltd., Toronto, Ontario

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Changing Methods of Depreciation

Contractors and other taxpayers who use the declining balance method of depreciation are not required to establish a salvage value for the asset being depreciated for a full recovery is not possible using this method. So notes a bulletin of the Virginia Road Builders Association, which noted however, that the question of changing from this method to the straight line method does involve the establishment of salvage values for all of the assets. The 1954 Code notes that such salvage value should be determined at the time of acquisition. The Internal Revenue Service in a ruling published on August 25, 1958, states that salvage value in this case shall be determined by the condition of the asset which exists at the date of the change rather than the date of acquisition.

Bulk Storage of Calcium Chloride

Highway engineers realize that mixtures of calcium chloride and sodium chloride effectively melt ice, in fact, faster than either of the chemicals will melt ice when used directly. However, the question of how to store chemicals for winter maintenance in bulk, in mixtures, has been a perplexing one. Recent tests referred to in an article in the Calcium Chloride Institute *News* throws some light on the subject of storing bulk chemicals in mixtures.

One test consisted of seven separate piles of mixtures of dry rock salt and Type 1 regular calcium chloride stored in an open-sided shed. This test was made in the Detroit area from October, 1957 through March, 1958. In all cases, materials underneath the crust of each pile remained as dry and workable as when placed. The crust served as a protecting cover.

The other test took place in Ohio; storage piles were covered by tarpaulin. Eight stockpiles were placed in March, 1958, and observed through May this year. One-half ton of mixed materials was placed in each pile. Piles consisted of dry calcium chloride mixed with various amounts of salt (which contained various amounts of moisture).

Results showed that the addition of 20 percent of calcium chloride to salt which contains little or no moisture resulted in a mixture which withstood two months storage very well. The 1½-inch crust which formed was easily broken and material underneath the crust was free flowing.

The Institute offers the details in a free bulletin, "Storage Proves Practical," available on request to the Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C.

Kansas Maintenance Data

The cost per mile per year of maintaining various classes of road in the Kansas highway system is reported for 1957, as part of the "State of Kansas Summary of County Engineers Annual Report." The cost for calendar year 1957 are in accordance with the accompanying table.

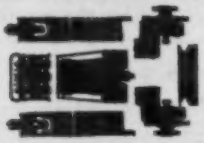
Average Maintenance Costs per Mile of County Road

Type	Miles	Cost per Mile
Unimproved Earth	6,329	$48.69
Std. Graded and Drained	18,759	77.48
Gravel and other Granular Surfaces	33,144	197.33
Bituminous Surface Treated	4,900	483.27
Bituminous Surface 1-in and over	379	770.45
Pavements	148	838.55

CONTRACTORS CUT COSTS WITH EIMCOS'

Move more earth at less cost with Eimco heavy-duty equipment

INDEPENDENT TRACK ASSEMBLY
Each track is powered and controlled separately — Tractor spin turns in it's own length, with one track in forward and the other in reverse.



UNIT ASSEMBLY
Each major tractor component is a separate assembly for easy maintenance or removal without disturbing other components.

INSTANT REVERSAL
No stopping, manual clutching or gear shifting to change directions — A pull on the track control levers immediately reverses the tractor.

FULL VISIBILITY
Up-front operators position eliminates all guess work in dozing, digging, pushing and loading operations.

Eimco heavy-duty earth moving machinery will permit lower bids on construction work.

Here are reports from a few jobs where Eimco equipment is being used:

1. Underground limestone quarry working an Eimco 105 on 2 levels to do all underground loading. — "Our maintenance parts and labor for the past 21 months have cost 2½ cents per ton."

2. Road contractors in the deep South — "We now have more than 17,000 hours on our 105 and have not had to open the transmission for any reason."

3. "We averaged better than 45 feet a day on our job mostly because of the 105's." — This letter from a tunnel contractor who is driving a large heading with two 105's working side by side.

4. Quarry contractor — "In a few days we should receive our third Eimco 105. These machines are gradually taking over all production and are replacing the boom shovel."

5. Railroad contractor — "Our 105 has replaced a 1½ yard boom shovel and a bulldozer we had used to move stone up to the shovel.

THE EIMCO CORPORATION • SALT LAKE CITY, UTAH
EXPORT OFFICE, 51-52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

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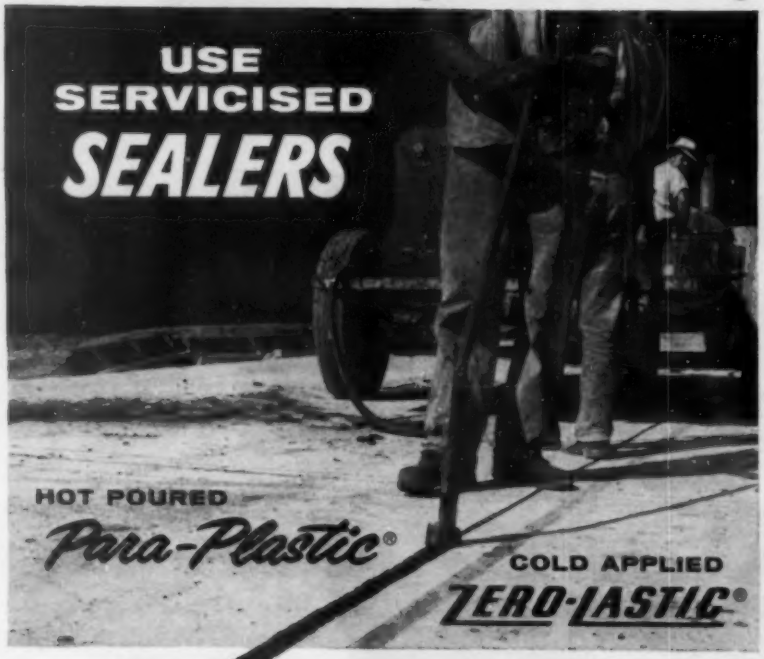
for *EFFECTIVE* joint sealing

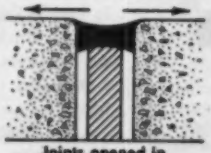


HOT POURED PARA-PLASTIC®

Para-Plastic is the *original* hot poured rubberized asphalt joint sealing compound that forms a resilient, adhesive and effective seal which maintains bond at sub-zero temperatures. Unaffected by extremes of temperature, Para-Plastic insures a moisture-tight seal of expansion, contraction and dummy joints in concrete pavement of all types. Para-Plastic JF is a special hot poured rubberized thermoplastic compound especially developed for sealing joints in pavement where they would be affected by spillage of jet fuel or other petroleum solvents used by aircraft.

Drawings at right illustrate sealing characteristics of Para-Plastic Joint Sealer during extremes of temperatures.

Joints compressed in warm weather temperatures.



Joints opened in sub-zero temperature.

COLD APPLIED ZERO-LASTIC®

Cold-Applied Zero-Lastic is available in two types: 1. Ready mixed regular Zero-Lastic designed for sealing narrow joints (⅛" and 3/16" wide) in concrete pavement where application of other types of material would be difficult without special equipment, and 2. Zero-Lastic JF a two-component jet fuel resistant sealing compound which sets up into a resilient rubber-like seal which is resistant to damage from petroleum solvents, for sealing joints in airfield aprons and other concrete pavement used by aircraft. Applied with pressure application equipment

Complete details are contained in the Servicised Catalog. Write for your copy today.

SERVICISED PRODUCTS
CORPORATION
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

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Better R-W Acquisition In Michigan Program

A new system of right-of-way acquisition for the Michigan state highway department, designed to eliminate "horse trading" with property owners and expedite land purchases, has been revealed by highway commissioner John C. Mackie.

The department must acquire over 50,000 acres of right-of-way in the next few years to meet schedule demands. The new policy, in use in many areas for several months, will now become general procedure throughout the state. It includes the following:

(1) A requirement for two independent appraisals from qualified sources outside the highway department of any parcel valued at over $25,000.

(2) Rigid and far more extensive requirements for detail in all appraisals.

(3) Rigid completion dates for all independent appraisals.

(4) Creation within the highway department of an appraisal section solely concerned with supervising and expediting appraisals by outside real estate consultants and reviewing appraisals before an offer is ever made to the owner.

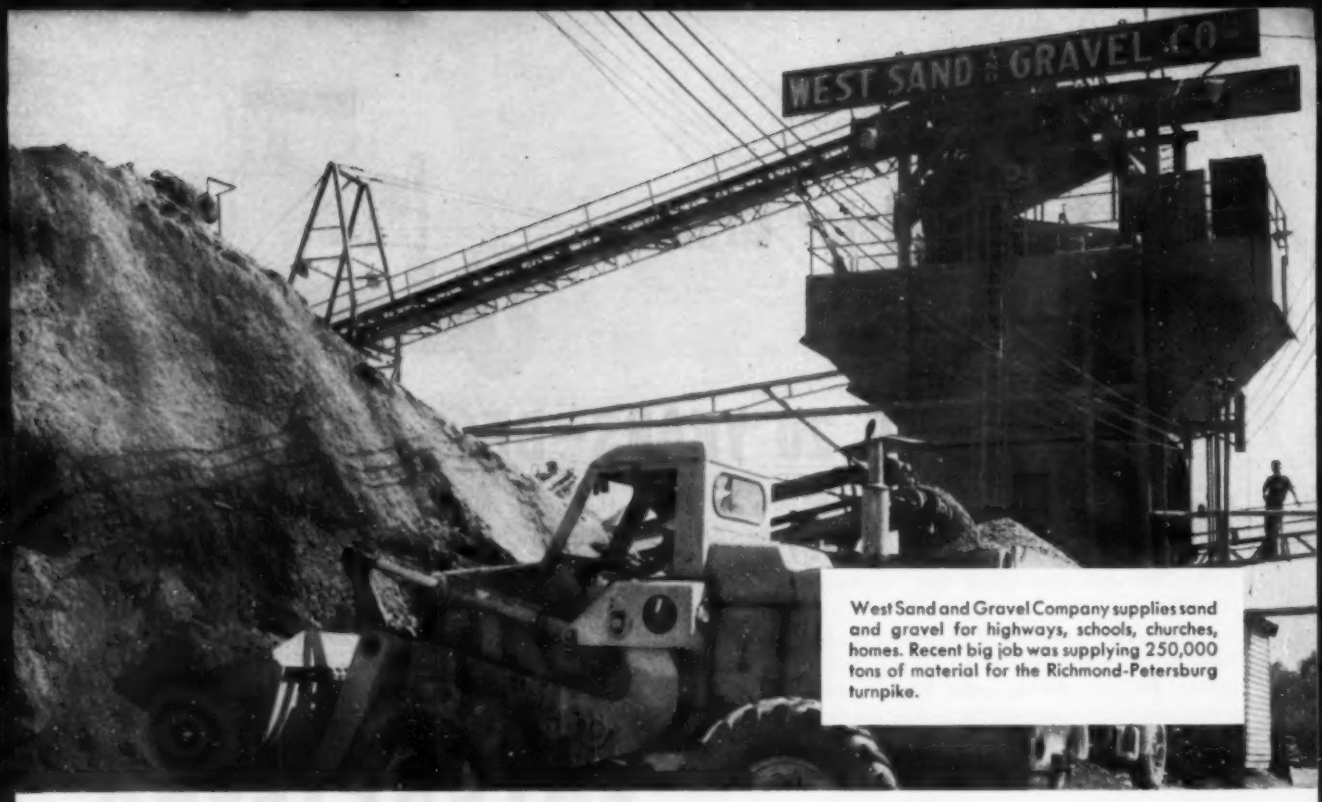
(5) Once an appraisal has been approved and turned over to a right-of-way representative of the department, he is ordered to stick by the established price.

"I want to eliminate the old system where the state might offer a low figure, the property owner demand an unreasonable price, with a middle ground compromise necessary to solve the question," Mackie said.

"More extensive appraisals will cost more but will pay off in quicker settlements and if we must go into condemnation to get property, they will stand up better in the courts. Also, completion dates are an absolute necessity for appraisals I've found cases in the past wher some appraisals dragged along fo over a year.

"Our policy" containued Mackie, "is that we pay the property owner a fair cash market value, a price which will neither enrich the owner at the expense of the public, nor the public at the expense of the owner.

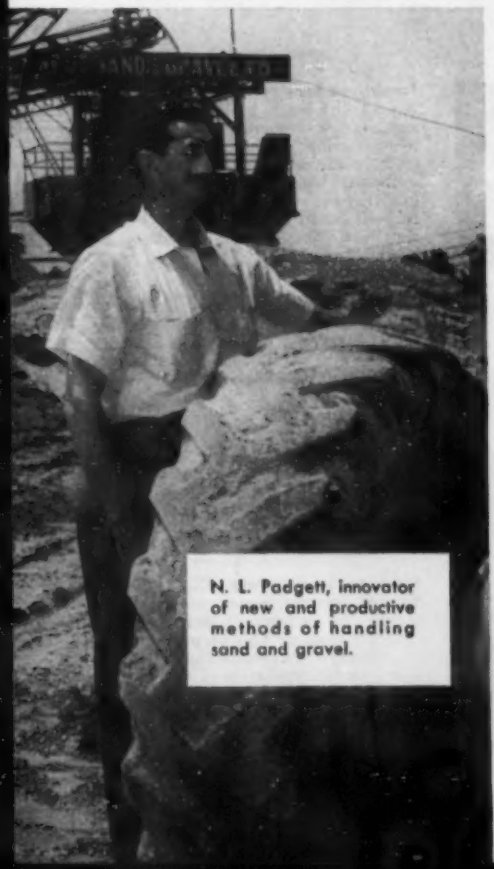
"No right-of-way policy will eliminate differences of opinion, but we are hopeful this policy will better assure our offer is fair and equitable as well as expedite the highway program."



West Sand and Gravel Company supplies sand and gravel for highways, schools, churches, homes. Recent big job was supplying 250,000 tons of material for the Richmond-Petersburg turnpike.

"Our equipment has worked up to 18,000 hours without major overhaul."

—N. L. Padgett, general superintendent
West Sand and Gravel Co., Richmond, Va.



N. L. Padgett, innovator of new and productive methods of handling sand and gravel.

When West Sand and Gravel acquired the site of its present operation, the output had been 35,000 tons of material a year. With N. L. Padgett as general superintendent, West is now producing 20 times as much material, with only three times as many men. Much of this increase can be credited to Mr. Padgett, who designed and supervised the manufacture of a new and more efficient washing and screening plant.

West operates 25 pieces of equipment using Phillips *66* products—cranes, bulldozers, front end loaders, pumps, road graders and trucks. Mr. Padgett says: "Our equipment works 24 hours a day in sand and water. We must provide the best protection possible. That's why we use Phillips *66* Heavy Duty Motor Oil, and other Phillips products. Some of our equipment has worked 18,000 hours without major overhaul, and one payloader worked 3,500 hours continuously without overhaul." In addition to Phillips *66* HD Motor Oil, West uses Phillips *66* gasoline, Diesel fuel and transmission and industrial greases.

Get the best long term performance out of your construction equipment. Depend on the outstanding products and service offered by your Phillips *66* Distributor.

Phillips 66

PHILLIPS PETROLEUM COMPANY

Call or write your nearest Phillips office

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MINNEAPOLIS, MINN.—215 South 11th St.
OMAHA, NEB.—3212 Dodge Street
RALEIGH, N. C.—401 Oberlin Road
SALT LAKE CITY, UTAH—68 South Main
ST. LOUIS, MO.—4251 Lindell Blvd.
SPOKANE, WASH.—521 East Sprague
TAMPA, FLA.—3737 Neptune Street
TULSA, OKLA.—1708 Utica Square
WICHITA, KAN.—501 KFH Bldg.

USE PHILLIPS *66* HEAVY DUTY MOTOR OILS

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Cat No. 12 Motor Graders!

BEST BUY FOR 20 YEARS—BEST BUY TODAY!

Here's why: When the No. 12 was introduced in 1938, it set new performance standards to become the leader in this type of equipment. Today it *still* is the leader, because Caterpillar has constantly built improvements into it.

Shown here are *some* of the many changes that have been made in the No. 12 to keep it the unquestioned leader. Its exceptional dependability and high resale value are common knowledge. Dollar for dollar, the No. 12 is the most valuable motor grader that you can own.

Compare today's No. 12 with any other motor grader—compare it with older No. 12s, too. By any measure you'll find it has grown in work ability, matched to meet today's exacting construction and road maintenance needs. For complete information about this modern, heavy-duty machine, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

FIND YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

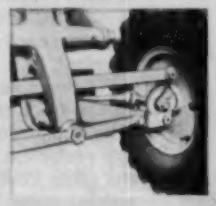
NO. 12 MOTOR GRADERS—BEST BUY BY ANY YARDSTICK!

Longer main frame adds extra clearance between the toe of the blade and the front tire for all blade positions. There's ample blade maneuvering space whether the No. 12 is equipped with 13.00-24 or 14.00-24 front tires. Curved side shift rack permits fast, easy blade positioning—all common blade positions are available to the operator without leaving the cab.

Exclusive oil clutch, the most advanced clutch design ever offered in a motor grader, provides up to 2,000 hours without adjustment. This is equivalent to about 12 months of "adjustment-free" operation. And because wear rate of clutch facings is so slight, down time for clutch repair is virtually eliminated. The oil clutch accounts for a large part of the No. 12's reputation of dependability.

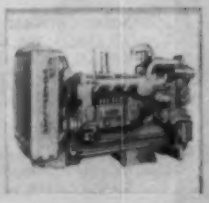
Unequalled visibility results from the No. 12's dash-mounted lift gears and low frame design. While seated, the operator has an unobstructed view of the critical areas at the front wheels, toe of the blade and circle. In-cab starting and easy-to-reach controls are other No. 12 features that help the operator work more efficiently.

Optional Preco Automatic Blade Control, available only on Cat Motor Graders, controls blade slope to an accuracy of within ¼" in 10', regardless of position of grader. Operator merely dials the required slope on the control, then follows the guide lines. Preco-equipped No. 12s cut conventional grading time as much as 50%.



Improved service life is built into the No. 12 with larger king pins and bushings, larger inboard spindle bearing, new steering arm pivot block with seals, improved steering booster with outboard bearing. No other motor grader can surpass the No. 12 for rugged construction—another important factor in the machine's dependability story.

Mechanical controls, standard on the No. 12, offer positive action, make blade adjustments precise. Powered right from the engine, they give a speed and range of blade movements no other unit can match. More than one lever can be operated at a time, without slowing blade movement. "Anti-creep" braking mechanism makes the blade "stay put" while under load.



Modern heavy-duty Cat No. 12 Engine features, among other advantages, the exclusive Caterpillar fuel injection system. This permits the use of economy-type fuels without fouling. The long-life reputation of Cat Diesels is well known—no other engine can match them for dependability!

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Central Mixing Plant–
Dump Body Delivery–

Contractor's Answer for Ohio Project

Large-capacity plant with 8-cubic-yard mixer kept paving and structure pours on schedule. Spreader designed for dump-body delivery.

A PAVING PROJECT near Mansfield, Ohio, was handled during the 1958 summer by a contractor who is quite a believer in the central-mix, truck-delivery method of producing and placing pavement concrete. The contractor is C. F. Replogle Company, of Circleville, Ohio. The job is a 4.96 mile dual segment of Ohio Route 13, designed as an expressway link leading into the Ohio "Route 1" freeway now under construction diagonally across the state.

The Replogle organization was not doing anything new when it set up the big central concrete plant for this 134,000 sq. yd. concrete paving job. The firm used two similar outfits on other Ohio jobs last year. The plant here described produced 3,000 lin. ft. per day (3,974 ft. maximum) of 9″ x 24′ concrete on a 1957 job which involved numerous complex features. This method, in lieu of pavers, permits pouring at several locations simultaneously.

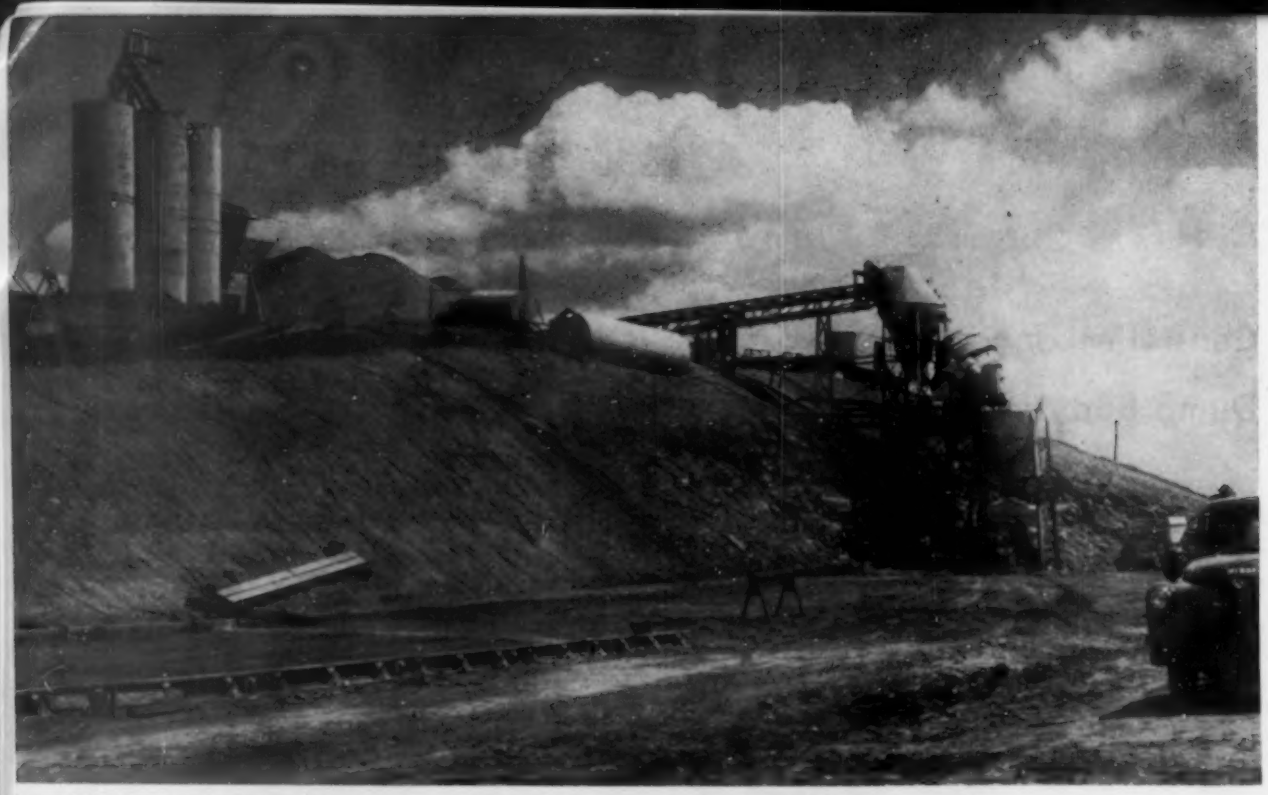
The Route 13 job suggested the central plant particularly, because of interchange ramps and decks involved along with paving of dual express lanes.

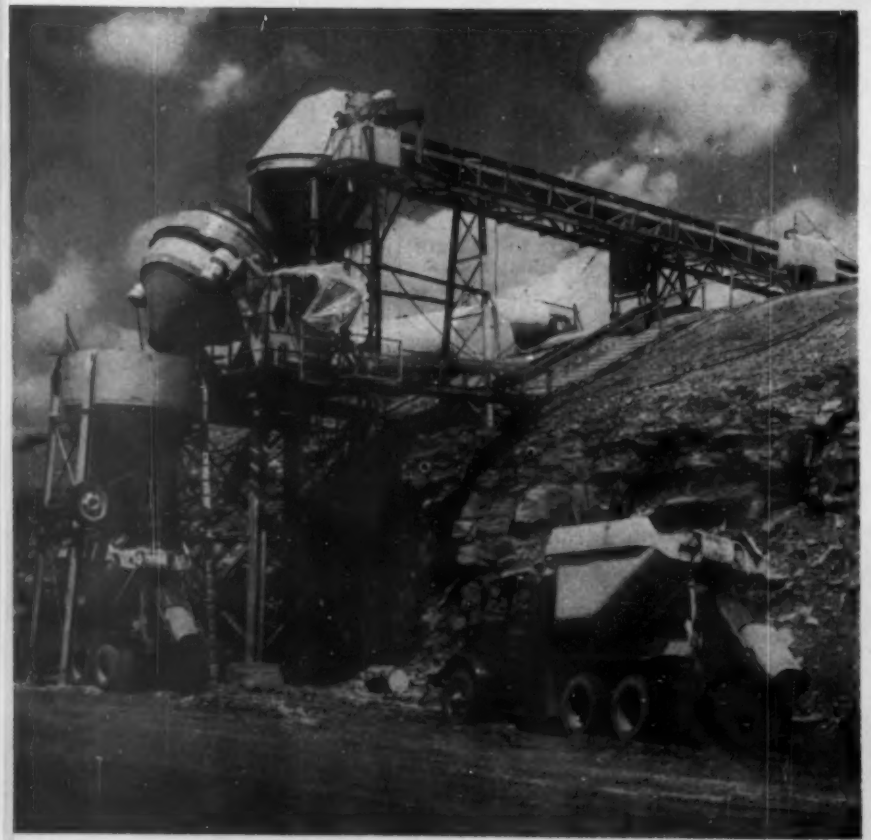
● *Plant on High Ground.* The central concrete plant was designed to produce 175 to 200 cu. yd. of concrete per hour. For this project it was located to take advantage of high ground, accessible from the existing road to the rear and overlooking a deep cut along the paving job. Stockpiled aggregates were loaded by a Koehring 605 crane into the 190-ton bin space of a Noble-Mobil automatic batching plant. Bulk cement was fed into the plant from a 400-bbl. bin in the Noble assembly. Cement storage was via three 800-bbl. Replogle built silos.

From this equipment proportioned aggregates and cement flowed onto a 36″ x 114′ belt, which passed the material with only a slight rise to a mixing plant located in the cut face. This assembly was built around a single 8 cu. yd. Burmeister tilting drum mixer, which dropped concrete into trucks on the highway berm. This unit also

3 and 4 Trucks Dump at a Time

The new Maxon spreader in action on Replogle's job. Dumpcrete bodies mounted on Autocar diesel trucks delivering and pouring from both sides, simultaneously for the advance half-depth strike-off. Two more trucks deliver at the same time for the final strike-off.





Gravity Works for This Central Plant

Two views of the central plant, as set up by C. F. Replogle Company for the Ohio Route 13 project. Equipment includes large cement silos, Noble batcher and Burmeister 8-yd. mixer.

was fully automatic. An Ingersoll-Rand 210-cfm compressor supplied gate power for the otherwise all-electric plant.

Darex air entraining additive was fed to the drum from a gravity tank in automatic calibrated amounts; additive was also stored in a larger tank close to the mixer.

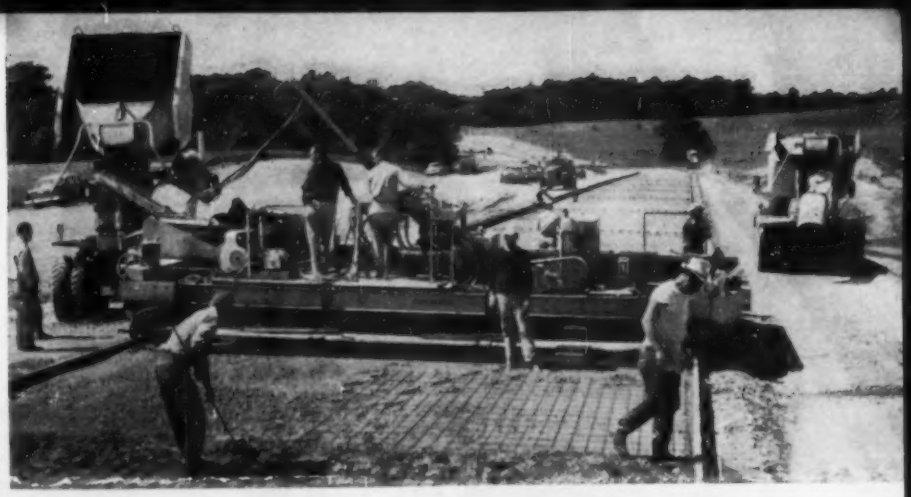
Also mounted along the top of the cut was a 10,000-gal. storage tank for mixing water. Water was truck-delivered to storage and fed to the mixer tank by a Jaeger 4-in. pump.

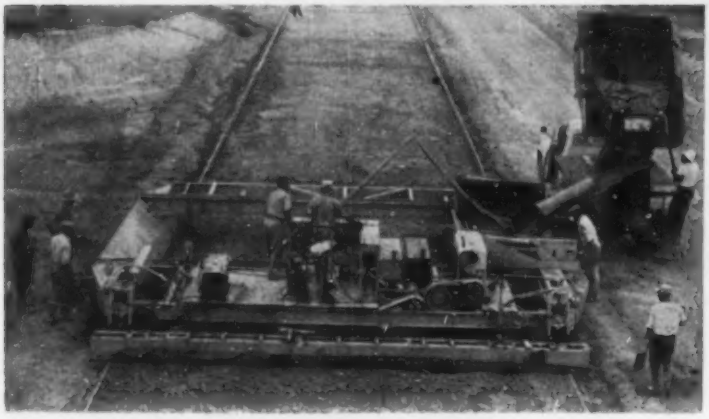
Electric power for both batching and mixing was furnished by a Caterpillar 375-kw diesel generator set, housed in a van-type trailer alongside.

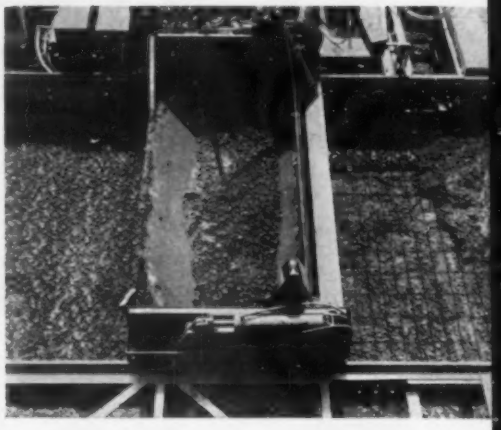
● *Concrete Delivery Trucks.* Delivery of concrete to the grade was handled by a fleet of trucks—16 in all—fitted with Maxon Dumpcrete non-agitating concrete bodies. The trucks included GMC and Ford and also six new Autocar Diesels purchased new for this job. Some of the dump bodies were equipped with sideboards, permitting delivery of 7½ cu. yd. of concrete per trip. However, the prevailing haul

Spreader Designed For Use With Trucked Concrete

Additional views of the Maxon spreader. A 4½-yd. receiving bucket travels transversely between the forms, depositing concrete uniformly, and thus minimizing lateral movement of concrete by the screed.







was from 3¾ up to 6 cu. yd. As a policy care was taken to avoid overloading the trucks for any given situation of soft ground, travel over the existing state road, etc., and for good equipment management.

● *New Maxon Spreader.* A feature has been the use of a new concrete spreader designed by Maxon specially to team up with Dumpcrete delivery. This unit, riding the forms for a full-width pour (24 ft. in this instance) embodies a receiving bucket of 4.5 cu. yd. capacity that travels transversely across the forms and places a predetermined thickness of concrete 12 ft. wide on the subgrade. As the machine moves ahead the adjustable strike-off screeds the concrete longitudinally. The placing rate is based on a 1.5 minute cycle allowing 60 seconds for loading, 15 seconds for placing and 15 seconds for movement and strike-off.

As a prevailing procedure on ex-

Dry Materials Blended In Automatic Plant

A blend of dry aggregates from the Noble plant flows in correct proportions on the 36-in. belt to the mixer.

● **Another view of the central mixing plant, showing the various subassemblies designed for quick knock-down for transport between jobs.**

press lanes, concrete was deposited simultaneously from trucks arriving along either side. The initial strike-off by the Maxon spreader was one-half slab depth below the form tops.

Following placement of reinforcement, concrete was delivered for the top lift, trucks again arriving and depositing simultaneously from both sides. Thus four trucks could deposit at any one time under ideal conditions.

The top lift was spread by a Jaeger machine with two spreading screws and carrying unit internal vibrators along slab edges. Finishing was by a Jaeger oscillating screed unit. Then came a Koehring longitudinal float, hand finishing, and curing application (Permite, via a Heltzel machine) in accordance with established practice. Joint sawing using two Clipper single-blade diamond saws was done by Pavement Controls, Inc., of Cleveland. This firm also sealed the joints, using Flintkote 77 cold compound.

● *Mix Design and Control.* The total concrete mixing cycle for the central plant on this project was fixed by the state highway department at 2 minutes and 45 seconds, compared with 1¼ minutes usually required for paver mixing. The concrete is a standard 6½ bag mix utilizing two gravel aggregates.

The department made no special change here in its usual project routine of furnishing a project engineer and other supervisors as necessary along with crews of trained inspectors known as engineer-aides. Constant checks of the quality and quantity of materials were made here, as on all Ohio concrete paving, and reported to the project engineer who kept a diary of the job. This diary was submitted daily to the construction department of the division headquarters where it was checked against the job specifications.

Progress on this job was considered satisfactory despite one of the rainiest seasons in Ohio's recent highway building history. Completion was scheduled for October 31, 1958.

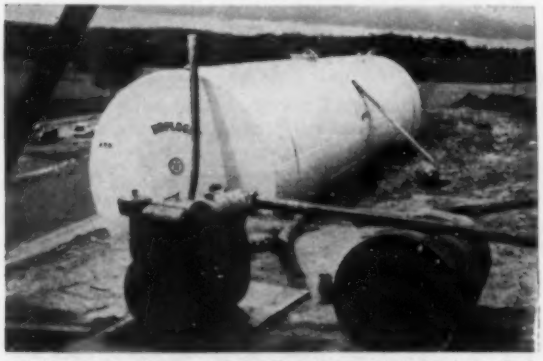
Louis Bizack has served as general superintendent for C. F. Replogle Company, with Glen Durst, concrete superintendent. Location and design were handled by Shaffer, Parrett & Associates, consulting

● **Large-capacity cement bins and large stockpiles—features designed to insure against job stoppage when good weather permits full speed ahead.**

● **Note the full belt load of dry cement and aggregates.**

engineers, of Mansfield, for the Ohio department of highways. W. J. Hazeltine is project engineer, under Division 3, Ashland, for which J. E. Halliwill is construction engineer and W. R. Hauserman, division engineer. Charles M. Noble is Ohio's director of highways.

● The Caterpillar 375 kw diesel-electric generating plant which powered the entire central plant was housed in this trailer.



● Water supply for the 8-yd. mixer—10,000-gal. tank fed by over-the-road tanker and tapped by 3-in. Jaeger pump.

● A handy rubber-tired tow cart carried two Clipper concrete saws from point to point. The bed level designed for handy transfer from cart to pavement.

Tractor 'Handy Man' Takes on Ground-Clearing Job

An International Drott TD-14 is a 'man-of-all-work' as it clears some ground near Chittenden, Vt. At upper left: the unit wears a grubbing blade to remove a boulder it had dug out of two feet of ground. Below: after bowling over a tree, the machine hoists it aloft on the grubbing blade to move it out of the area. At left: the unit, using the 4-in-1 attachment, deposits a load of earth and stones in a truck.

How To Gear Up Existing Roads

– New Jersey Has Six-Point Program

● Newly striped pavement, showing edge line, now standard equipment on New Jersey's highways.

Congestion and accidents are being systematically reduced in New Jersey by applying a combination of improvements

IN NEW JERSEY the state highway department is not waiting for the Interstate projects to solve all its traffic problems. It has spent more than $13 million over the past three years building new safety and capacity features into older state highways.

This state's highway problem is unique in that its road system has the densest traffic flow of any state. The count on the state system averages over 11,000 vehicles daily. Some segments carry 50,000 and up to 135,000 vehicles per day. The existing state road network is badly outgrown despite a relatively high degree of dualization. Some of the less heavily traveled roads are still only 18 and 20 ft. wide and many have insufficient shoulder width.

The sprucing-up program has been characterized by Highway Commissioner Dwight R. G. Palmer as "half-soling and heeling."

The effectiveness of the program lies not in any single type of improvement but in a systematic application of all types. These include conversion of undivided multi-lane highways into dual roadways by building center barriers; the addition of creeper lanes on hills for trucks; the construction of "jug-handle" right loop facilities to avoid dangerous lefthand turns at intersections; and construction of overpasses at points where they are most sorely needed.

Overpasses have been constructed largely with state funds, federal money being reserved for purposes of matching federal allocations under the expanding interstate program.

The department also has had in progress for some time a continuing force account program of widening and hard-surfacing existing highway shoulders, and of painting reflectorized white lines on the outer pavement edges of the entire highway system. It is currently redesigning its signing system, with definite safety objectives in mind.

Some of the specific figures given out by Commissioner Palmer include: 40 miles of heavy concrete center barriers, built since 1954 at a cost of $1,380,000.

The Commissioner noted that the overpass and interchange costs to improve certain bad intersec-

New Jersey, Little State, Big Road Needs

Modernization of New Jersey's state highway system to meet anticipated 1975 traffic will cost over $23¼ billion, according to highway commissioner Dwight R. G. Palmer. The cost estimate is the result of a two-year "needs study."

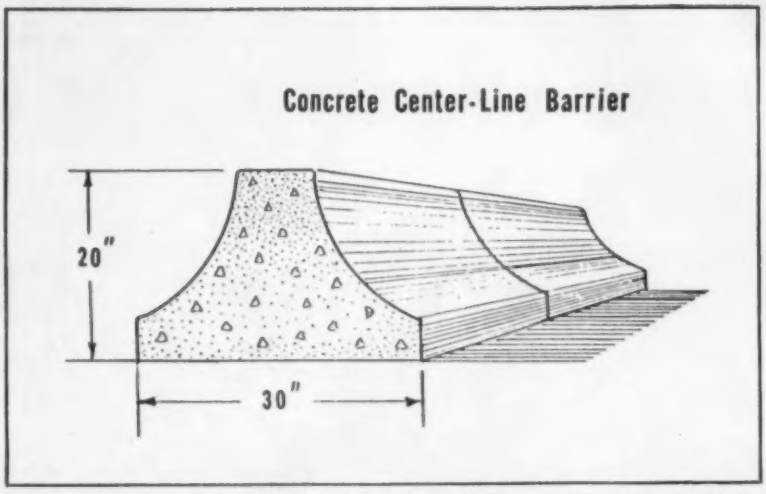
Traffic projections, concurred in by the Federal Bureau of Public Roads, indicate that vehicle-miles of travel in New Jersey will practically *double* by 1975.

The job will entail 821 miles of new freeways; dualization or widening of more than half the present 1,830 miles of state highways; plus numerous resurfacing and intersection improvements. This program, Palmer emphasizes, would require a far greater financial effort by the state than simply matching federal-aid funds. Present matching sources would permit doing only about half the job by 1975.

tions have been very high, due partly to the necessity for acquiring expensive business frontages and relocating utilities.

General tinkering with the grade and alignment also has not been neglected. Present main-line highway design standards have been raised well above the minimum acceptable in the federal-aid project. In improving segments of existing highway, grades are being flattened at spot locations, curves eased, super-elevation corrected, shoulders rebuilt and in all cases armored to reduce maintenance costs. These improvements are built to the same standards used in constructing new projects.

An additional $70,000,000 at ·ast is estimated to be needed to ·fect the projects now listed as essential to safety.



● Type of barrier adopted for 28 miles of 4-lane highway in New Jersey to date.

Concrete Center Barriers Bring Dramatic Accident Reduction

During the past three years the New Jersey state highway department has concentrated on centerline barriers. As described in a news bulletin for the press, "these barriers are used as a positive means of eliminating head-on collisions on many undivided and overburdened routes."

About 28 miles of barriers have been erected to date, with the program continuing at an accelerated pace. Several types of barriers were experimentally installed, but the most commonly used device is solid concrete, 30 in. wide at its base and extending 20 in. above the pavement.

"Over-all, the results have been dramatic to say the least," notes this bulletin. "On Route 4 in Englewood, where 48 to 50 thousand cars a day use the highway, there were six fatalities in the 33-month period preceding erection of the barrier. All were due to cars crossing the centerline. There has been one such fatality since April of 1955, the completion date of the barrier construction for this location. This is believed to have been caused by adjacent sloping curb—a design that has been discontinued since 1954.

"In Hillside, where up to 59,000 cars a day traverse Route U. S. 22, a total of 11 persons have died in the three-year period before erection of the barriers in 1954. There have been no deaths due to head-on collisions since then.

"More than two and one-half years have passed since erection of a centerline barrier on Route 4 in Teaneck. In this area, where 51,000 cars a day pass, there have been no head-on collisions reported during that period.

Chart Simplifies Blasting Cost Analysis

The Atlas Blasting Cost Chart has been published to help the user of explosives compute and analyze his true excavating costs. To assist the explosives user in applying the chart to his particular operation, Atlas Powder Company has also published two booklets on the analysis of blasting costs.

Printed in file folder form so as to be useful as a permanent record, the four-page Atlas Blasting Cost Chart provides space on the first page for recording all pertinent data about the blasting operations being analyzed. Specific cost entries and calculations are made on the inner two pages. The fourth page contains space for pertinent remarks as well as a check list of efficient blasting practices.

One of the two accompanying booklets, the "Blasting Cost Control Manual" discusses the techniques of computing and controlling excavating costs. The second pamphlet gives detailed instructions for using the chart and is titled "How to Use the Atlas Blasting Cost Chart."

For further information, write Technical Customer Service Section, Atlas Powder Co., Wilmington 99, Del.

Pump and Mixer Bureaus Study Standards Changes

Proposed changes in contractors pump standards and concrete mixer standards were discussed at the summer meetings of the Contractors Pump Bureau and the Mixer Manufacturers Bureau at Chatham Bars Inn, Chatham, Mass.

Further consideration of the proposed changes in the standards will be given at the annual meetings of the Bureaus in Chicago in December. Actions of the two Bureaus on these changes will be subject to approval by The Associated General Contractors of America.

The Mixer Bureau also reviewed proposed changes in its standards and a special committee was appointed to study the portion related to the 3½S type mixer. The bureau recently extended its standards to include plaster and mortar mixers, and is now considering the feasibility of including concrete paving machinery.

The campaign to promote universal adoption of these standards was also discussed at the summer meetings. Also a method of compiling and issuing the monthly statistics on pump and mixer shipments.

Outside Camarillo, Calif., U. S. 101 is being relocated and improved. J. E. Haddock Ltd. is handling 5-mile project, moving a million and a half cu. yd. — mostly rock. Haddock moves about 7,000 cu. yd. a day.

Four CAT D9 Tractors are on the job here, along with five D8s, three No. 12 Motor Graders, three DW21s with Scrapers, three DW21s with Athey PR21 Wagons, and a D13000 Caterpillar Diesel Engine.

Two of the three Caterpillar DW21 Tractors with Athey PR21 Wagons loading up for another fast rock haul on U. S. 101 project. Conditions like this explain why Project Supt. Saul says he picked Caterpillar for its "ability to do the tough work."

Athey PR21, teammate of DW21 Tractor, can haul 34 tons of rock or other material efficiently. On this job it hauls about 18 cu. yd., making 1-mile round trip in about 12 minutes—against a return grade of 12% in places.

RELOCATING U. S. 101

"This job is plenty tough. We called on Caterpillar-built equipment for this one. We get good service with very little down time—and then our Caterpillar Dealer goes all out to see that our machines are back at work as soon as possible."

Project Supt. Neal Saul's words should ring a bell for you, too. See *your* dealer for the machines that handle the tough jobs in stride. See him for replacement parts you can trust. See him for the fast, thorough service that keeps your machines making money.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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WHEN THE JOB IS PLENTY TOUGH

D9 with No. 9S Bulldozer moves rock in a hurry. The LOAD SHAPE No. 9S is a 14-ft. blade with a cutting edge made of "Hi-Electro" hardened steel. A push cup mounts easily, right onto the blade, when desired. The D9 delivers 320 HP at the flywheel. With its optional three-stage torque converter, the D9's output is automatically matched to the load.

• Pennsylvania's highway maintenance, heavy on patronage labor and light on modern mechanical methods, is causing citizens wasted millions of dollars annually.

Drastic Overhaul Prescribed for

Study report of the Automotive Safety Foundation spotlights state's department of highways as ill organized and manned to handle its multi-million-dollar expanded program. "Take department out of politics," is at top of list of recommendations to attract personnel, step up efficiency and give a better shake to state's contractors.

By Duane L. Cronk

Director, Highway Information Services, Washington, D. C.

A COMPREHENSIVE INVESTIGATION into the management of the Pennsylvania State Highway Department, an organization which suffered a crippling loss of engineers shortly after an administrative change several years ago, has just been completed by the Automotive Safety Foundation in Washington, D. C.

ASF had been called in at the joint request of the governor and the state legislature to investigate the administration of highway affairs in the state. The request was sparked by torrid newspaper charges that politicians were wrecking the highway department. The Foundation thoroughly explored basic highway policy in Pennsylvania, top management, department organization, relationships with contractors, planning of future highways, design and maintenance practices, and other aspects of highway department administration, a number of which have been under attack in the press and the legislature.

The Foundation's first and major finding was that the department is dominated by politics and that its internal operations are adversely affected all down the line.

"There is need for drastic changes in the traditional policy with respect to organization and administration of highway affairs in Pennsylvania," ASF's President, J. O. Mattson, asserted in the bluntly worded report. Here are major ASF recommendations:

• Separate permanently, by statute, policy making and administrative responsibilities in the department. This can be achieved, ASF said, by the establishment of a part-time highway commission, with specified policy-making duties and responsibilities. The Commission would appoint a highway director as its chief executive whose administrative duties also would be specified by law. An alternative recommendation: Assign policy-making responsibilities to the secretary of highways (in lieu of a Commission) and create a new position of chief engineer, who would be a career official, to assume administrative responsibility.

• Put all permanent salaried personnel and

Editorial Note—Readers may recall the article, "When the Political Axe Wrecks a Highway System," which appeared in Roads and Streets, July, 1957. That review could only appraise the political system and its bad results. The report of the Automotive Safety Foundation here highlighted is thoroughly constructive—a recommended course of remedial action is offered for each ill diagnosed.

A succeeding issue of Roads and Streets will present in full the Foundation's carefully-worded recommendations for revamping Pennsylvania's top highway management. This is believed to be an utterance of historic importance and reference value in the guidance of policy making on highway administration in any state.

Pennsylvania's Road Management

ARCHAIC "PATRONAGE" MAINTENANCE METHODS PANNED

The Automotive Safety Foundation found much at fault in the Pennsylvania department's maintenance organization. As with the rest of the state's highway set-up, almost all of the faults they found stemmed from the political patronage system. Nearly all of the labor force and 85% of the superintendents and special foremen have been with the department less than four years, as a result of a major turnover. Thus maintenance operations at the beginning of the current administration were almost totally under the control of inexperienced and therefore unqualified persons, the report says.

"Superintendents who know little about maintaining roads and bridges cannot successfully train foremen who know little about maintaining roads and bridges, who supervise laborers and operators who know little about maintaining roads and bridges."

Maintenance in Pennsylvania is a huge operation, requiring $44 million per year and nearly 10,500 employees. The Division also currently does about $15,000,000 worth of maintenance-force *construction* each year. Three other states rank above Pennsylvania in number of miles of state highway maintained, but total maintenance costs in Pennsylvania are the highest in the nation.

ASF charged "Maintenance is geared around maximum use of hand labor. This is a reflection of the patronage system long in effect.

ASF's recommendations: Reorganize maintenance operations around greater use of equipment, replace obsolete machines, let routine resurfacing and sealing projects to contract, undertake a district-by-district study of maintenance needs and expand the bridge repair and replacement program. And, again, put all permanent maintenance men under civil service.

hourly workers in the highway department (except the top administrative officials) under civil service by legislative action.

- Modernize Pennsylvania's right-of-way acquisition statutes, providing authority to acquire land for future construction. Amend the existing limited-access law.
- Begin immediately the collection of factual data needed for comprehensive state-wide analysis of highway needs and future highway construction.
- Reclassify all roads and streets in accordance with their function, traffic volume and other pertinent data.
- Give the highway department responsibility for the traffic engineering control of rural state highways, and authority to install traffic control devices in urban areas, including the right to share in their cost.
- Reorganize the maintenance division around maximum use of machines rather than maximum use of political appointees.

Political Domination at Fault

Although the Automotive Safety Foundation pointed out early in its report that its findings are in no sense intended as criticism either of the legislature or the state administration in Pennsylvania, the engineers put their finger bluntly on the real problem in the state.

"Most of the deficiencies in the present situation," the ASF report reads, ". . . have their roots in political tradition."

Those political "traditions," ASF found, have created the most critical problems and will effectively frustrate effective highway administration in the crucial two decades ahead. Unless changes are made, the state will have serious difficulty in recruiting and retaining qualified personnel.

"The Department is suffering from a serious shortage of engineers and other technical personnel," ASF said. And because of rapid turn-over, it is unable to retain an adequate corps of experienced, qualified personnel in other job classifications.

This problem is the direct result of a political patronage system, ASF found. In Pennsylvania, engineers and others are given their jobs on the basis of political sentiments, rather than professional merit. This is the basic problem underlying "virtually all of the difficulties of achieving effective and economical highway administration," the Foundation declared.

The Foundation found that political domination has prevented the department from attracting "professional" engineers. For example, of 543 employees and engineers at present, only 92 are graduate engineers. An additional 54 are registered engineers, but are not graduates. The remaining 73% of the total engineering force are neither graduates nor registered engineers. (This compares with an

the department only 3 years or less. Even in the top echelon of 45 engineers holding key supervisory positions, 25 (or 55%) have had 3 years or less of service with the department (dating from the last political upset). Among 2,202 other employees in technical jobs in the department, 72% have been with the department 3 years or less.

ASF found, from examination of records, that 6 of the 11 incumbent district engineers and *all but one* of the present top-level executive staff had no service with the department prior to their present appointment.

These facts bear out findings revealed by *Roads and Streets* magazine 15 months ago, that politicians had discharged or forced the resignation of dozens of experienced engineers in the department, when the politicians came into office three years ago.

ASF says "The current situation is serious, the outlook is far worse."

More than half of the department's employees today are more than 50 years old. Nearly 75% are over 40. During the next decade, the department will lose one-third of its engineering force from age alone. This is particularly serious in a system which does not encourage the recruitment of young men to replace those retiring, ASF pointed out.

Two comparable states (Texas and California) have a ratio of 4.6 professional engineers to each million dollars in contracts awarded. In Pennsylvania the ratio is 0.8. The Pennsylvania department needs 500 more professional engineers to bring its performance up to reasonable efficiency ASF asserted.

What to do about this situation? ASF declared, "The only permanent solution is to take the department out of politics."

Its major recommendations:

1. Establish a legal civil service system for all permanent employees of the highway department, with an examination program which will enable qualified engineers and other technical personnel to obtain jobs on the basis of merit and experience, rather than by political endorsement. Eliminate the necessity for such men to have to contribute to party activities in order to hold their jobs.

2. Initiate an aggressive and far-reaching recruitment program to obtain 500 more professional engineers, including many under 35 years of age.

3. Follow a policy of filling key administrative and supervisory positions from the ranks of qualified career employees.

4. Step up training of sub-professional personnel.

Post-Qualification Deplored

The state's contract construction practices are surprisingly well handled in many respects, less so in others—see accompanying boxed details.

The state follows some procedures, ASF said, which do or could generate additional inefficiencies. It found fault with Pennsylvania's practice of "post-qualifying," rather than "pre-qualifying" contractors, contrary to general practice in other states.

ASF reported, "Any contractor can bid in Pennsylvania regardless of the size of the job, his financial standing, the size and type of equipment fleet, the degree of adequacy of his skilled labor force, experience record, or the amount of work the contractor has under way."

Investigation of a contractor's qualifications after bids are opened embarrasses officials, causes unnecessary work for contractors, and causes delays in getting projects under way, ASF said.

Related to the qualifying problem, the Foundation found, is the "required equipment list." A list of equipment which the contractor is required to have on the job is presented to each contractor at the award of contract, and, apparently, it is too rigidly enforced in some instances. Pre-qualification should determine whether or not a contractor's equipment fleet is adequate to do the job, ASF said, but should leave to the contractor the prerogative of scheduling his equipment to obtain its maximum use. His actual work accomplished should be the criteria of his performance.

Pre-qualifications too would help to minimize "contract brokers" who sub-contract almost all the work, doing little, if any, work themselves, ASF found.

The Foundation criticized the fact that half of the senior construction inspectors and 90% of the junior inspectors and assistants assigned to construction have been

State's Construction Practices Mostly OK

The Foundation also investigated the department's construction practices and its relationships with contractors. This was one of the very few aspects of administration with which the Foundation found little to criticize. About specifications, the report said:

"Pennsylvania highway specifications are good. Major items show a trend toward the performance criteria which gives the desired quality of work at the most economical cost. A progressive attitude toward the nature of the specifications is reflected in the changes which are a continuing occurrence."

About construction quality, the Foundation said:

"Highway facilities constructed by contractors in Pennsylvania are well built, according to design. No sweeping changes in quality of construction are suggested."

ASF did find, however, that the department needs to take steps to remedy conditions which "breed delay and uncertainty and can mean higher costs than necessary." It specifically cited such problems as:

- Shortage of project engineers and construction inspectors—part of the over-all personnel problem.
- Cases of incomplete and inaccurate design plans resulting in considerable extra work by construction engineers.
- Delay in headquarters' decisions on change orders and extra work orders.
- Delays in clearing right-of-way.
- Delays in final settlements with contractors.

with the department less than four years and many are too inexperienced for this responsible work.

"Many of the inspectors and engineering assistants are unqualified and are admittedly political appointees," the report reads. "The past chief construction engineer estimated that 60% of his force was qualified. Contractors estimate only 40%. Personnel records indicate this latter figure to be closer to correct."

ASF also took issue with the procedure followed by the department in processing work orders. It was found that all extra work must be approved by the top official or his designated assistant, and no contractor is authorized to proceed until such approval is obtained. Moreover, work orders must be cleared through the comptroller's office and in some cases approval is needed by the Bureau of Public Roads. ASF found that this processing procedure takes about 2 weeks, in some cases, even months. A sample of two years' projects revealed that work orders average about 1½ per project, although on some projects, work orders reported were excessive—a total of 11 in one case and 22 in another. The Foundation concluded that corrective steps should be taken.

Contractors also experience delays when they cannot clear rights-of-way because of utility relocation and unvacated buildings, the ASF found. Contractors in the state consider this a major problem. There were reported instances where utility companies knew nothing of impending jobs until the job conference just prior to construction. ASF said "The too-short time between official and final notice of taking, and the start of construction, coupled with the delay in payment for taking, results in deplorable situations."

The underlying cause of these difficulties is lack of a definite long-range improvement program which sets up a proper sequence in planning and constructing highway projects.

Progress payments to contractors as work is done are good, ASF found, and contractors are satisfied. However, they do complain about an excessive time required to obtain *final* payments. ASF's recommendation: "Pennsylvania should speed up its final payments to contractors."

The destruction of the Pennsylvania department's corps of professional engineers has forced the state to lean heavily on outside consultants, ASF found. Best estimates indicate 90% of plans are prepared by contract engineers.

This trend should be reversed, the Foundation believes. A staff of engineers should be built up which can assume a greater portion of the future design job, and ultimately the services of consultants should be retained "only for the more unusual and complex work of large structures, interchanges, and urban freeways, and for peak work loads."

In addition, the preparation of construction plans for widening, resurfacing and reconstruction on existing alignment should be discontinued, and this type of construction be let at bid prices on a typical cross-section and center-line profile. Projects for which plans are necessary for right-of-way acquisition and ordainment by local units of government are excluded from this recommendation.

Split Girders, Feature of New Bridge

Several design features are to be seen in the Tennessee River Cedar Street Bridge, recently under construction at Chattanooga for the Tennessee department of highways and public works.

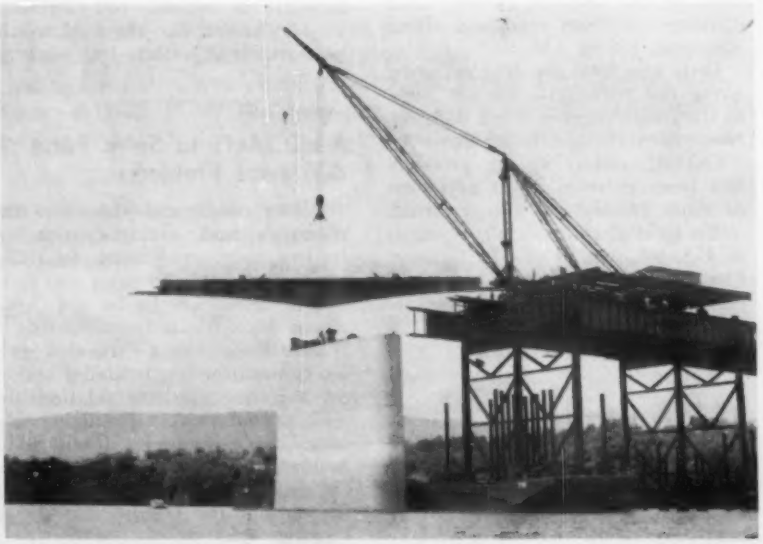
The finished structure will require only 6,572 tons of steel as the result of using a high-strength medium-manganese steel in the continuous girder units permitting a substantial reduction in the overall weight. Erection officials explain that because of the high-strength steel usage, this bridge very likely will exert considerably influence on the design and erection of other similar structures.

Among other interesting features of the finished bridge will be its continuous plate girder span, 925 ft. long and weighing 3,193 tons. This span is composed of three sections, 275-375-275 ft.

With a total length of 2,641 ft., the bridge will cross the 350-ft. navigation channel at a height of 72 ft. There will be two concrete roadways, each 26 ft. wide.

Two 115-ton travelers, one on each side, are lifting the 124 girder sections into position. The individual girders vary in length from 55 to 137½ ft. (14 to 84 tons). The greatest depth of the girders is 18 ft., 7 in. over the piers for the continuous main channel span, and split horizontally into two sections for erection.

Designed by A. F. Hedman, of Chattanooga, the finished bridge will contain 144,000 rivets, 10,000 high strength bolts, and 10,000 machine bolts. Steel was fabricated at the Rankin, Pa., works of Bethlehem Steel Company and taken to the site on barge by inland waterways.



● **Setting the lower section of the first large haunch girder to be erected completely over water—new Tennessee River Cedar Street Bridge at Chattanooga.**

Highway Lighting

New Evidence of Safety Value of Highway Lighting

Results of a recent two-year study of traffic accidents and fatalities on a three-mile stretch of suburban highway have provided striking new evidence of the important role that adequate highway lighting plays in the reduction of nighttime traffic accidents.

A 32 percent reduction in nighttime accidents, a 38 percent drop in property loss, and the elimination of after-dark fatalities were brought about by the installation of modern highway lighting equipment, the study revealed.

Commenting on the results, A. E. Huber, director of traffic safety for the State of Indiana, said: "It is important to keep in mind the fact that these reductions can be largely attributed to improved lighting since no other major preventative efforts were applied during the period of comparison."

Conducted by the Indiana Highway Department and Indiana State Police, the test covered a one-year period prior to installation of lighting and a similar period following installation. The area singled out for the study was on U.S. 40, a typical urban highway located near highly populated Indianapolis.

Highlights of the study reveal that nighttime accidents dropped from 100 to 68 following completion of the lighting system while daytime accidents remained about the same, 140 vs. 138.

Only one fatal accident occurred along the three-mile stretch prior to the installation of fixed lighting. None occurred the following year.

Overall reduction in property loss from reduced night accidents of about $15,500 was also reported.

To light the three-mile segment of U.S. 40, a total of 176 General Electric filament luminaires were mounted opposite on 6-ft. brackets at intervals of approximately 125 ft. and at heights of 30 ft.

2.3-Mile Interstate Section To Be Lighted

A segment of interstate freeway Route 102 at Clinton, New Jersey, is to have an installation of permanent overhead lighting.

Temporary lighting was installed, according to the New Jersey state highway department, to permit opening the project in September of this year. Bids were taken for about 40 overhead permanent lighting units, with the provision that electrical work for the pemanent installation would not interfere with traffic and that the work would be completed within 100 working days.

Highway Lighting Committee Gets Together

Members of the Safe Highway Lighting Committee of the Street and Highway Safety Lighting Bureau are shown here at a meeting held in the Bureau offices in Cleveland. Editing the soon-to-be-published Highway Lighting Reference Guide, left to right: Arthur D. Harrington, the General Electric Company, Hendersonville, N. C.; Robert R. Schroeder, Editor, Street and Highway Lighting Magazine, Cleveland, O.; Edmond C. Powers, Committee Secretary and Educational Director of the Bureau, Cleveland; Stacy Standley, Committee Chairman, Line Material Industries, McGraw Electric Co., Milwaukee, Wisc.; Thomas J. Ryan, Secretary, Street Lighting Section, NEMA, New York City; Dana Rowten, Westinghouse Electric Corporation, Cleveland; and Eugene V. Bailey, The Union Metal Manufacturing Co., Canton, Ohio. The Guide which contains basic information required for the design and maintenance of highway lighting systems, treating the subject in a manner usable to interested laymen as well as skilled engineers, has been designed to provide concise, correlated and condensed information on the vital subject of highway lighting. The Street and Highway Safety Lighting Bureau is a public information activity of the Street Lighting Section of the National Electrical Manufacturers Association.

A.E.D. Acts to Solve Parts & Service Problems

Closer cooperation between distributors and manufacturers of construction equipment to solve problems related to parts and service, is being sought by the Associated Equipment Distributors.

The Association's Parts and Service Committee has initiated action on a joint-committee relationship with manufacturers on such problems. The ultimate result will be to increase the services provided users by distributor members of AED throughout the United States and Canada.

Members of AED's Parts and Service Committee who took part in the meeting are: Chairman G. W. Blout, Bode-Finn Co., Cincinnati, Ohio; E. H. Barkham, Contractors Machinery Co., Detroit, Michigan; Martin Davis, The G. W. VanKeppel Co., Kansas City, Missouri; A. P. Hahn, Edward R. Bacon Co., San Francisco, California; Lester Pogue, Shaw Sales and Service Co., Los Angeles, California; and, J. B. Supler, Rish Equipment Co., Bluefield, West Virginia.

Tree Saving Program

Attention to the preservation of roadside trees is receiving emphasis in the Kansas state highway program. Department leaders have been instructed to work toward least possible damage to trees and shrubs during maintenance or construction.

Special tags have been issued for resident engineers and division landscape architects to use in selecting trees to be saved. A small two-inch tree is given the same protection as a large mature tree, according to Franklin T. Rose, the department's landscape architect.

Lima Austin-Western Model 101-S Plant, owned by C. W. Allen, Wilburton, Okla., producing gravel filter for Table Rock Dam on White River.

LIMA Austin-Western 101-S Plant Speeds Dam Project in Missouri

This high-capacity Model 101-S Plant is being used to produce gravel filter for the slope of Table Rock Dam, on White River, near Branson, Mo. Using riverbed gravel, the plant turns out an average of 100 cu. yds. per hr. of material ranging in size from 3 in. down to fine sand.

This portable crushing and screening plant sets a new high standard for high production and low maintenance. While intended primarily for gravel operation, it performs equally well in quarry service when combined with a portable primary. Standard equipment includes a 10 x 36-in. primary jaw crusher, a 30 x 20-in. roll crusher, 30-in. conveyors, and a 4 x 12-ft. inclined, positive-throw type vibrating screen. It may be had with either a shovel-loading hopper or a swivel drive for feed conveyor. It is a completely self-contained unit that can be transported over most highways without special permit.

Make your next crushing and screening plant a Lima Austin-Western for all-around economy and greater returns on the investment. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

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BEST BUY IN NEW AND USED EQUIPMENT

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Editorial

CONSULTANTS AND CAREERS

THE CHALLENGE issued by a highway consultant to the state highway departments, to make greater use of private enterprise in their engineering, focuses on a subject having far-reaching implications. We refer to the statements quoting John Clarkeson, as reviewed in the Washington Newsletter, August *Roads and Streets*.

Readers will recall that Clarkeson pointed to the often greater efficiency of engineering as performed privately under such government agencies as the AEC and others, as compared to the work done by some road building agencies today.

One far-reaching implication was not touched on in our August Newsletter. That has to do with the effect which present highway department policies may have on the ultimate future of civil engineering. Clarkeson believes that the wide-spread assumption of engineering functions as a broad function of government limits opportunities for engineers. To be an engineer in the highway field today increasingly means to be a public servant, with the attendant limitations on salary, opportunity to develop and use initiative, and other career limitations.

And, not mentioned by Clarkeson, there is the matter, repugnant to a professional man, of living out a career subservient to and at the mercy of whatever political administration is in power over the highway department. In some states this political domination regrettably still exists, and is a problem of highway administration far exceeding any aspect of technology in the efficient performance of engineering and construction.

● Clarkeson, who himself has come up through public highway organizations and is a seasoned and acknowledged top-grade highway engineer, has done well to bring this problem out in the open. On one side of the picture, there is no service of government in this country which, by and large, is so ably planned and carried out as the highway program. Any historian on examination of the work over the past four decades would agree to this statement.

But on the other hand, member organizations in the AASHO cannot afford to be in the category of many another state and federal agency, i.e., of jealously guarding and fostering their bureaucratic growth, and showing little understanding of the principle of private initiative on which our country's greatness is built.

The public will be best served in the long run if private engineers can be given a chance to perform an important share of the total highway job. Highway administrators are facing a test of their willingness to look at this matter objectively, and of their ability to make effective use of consultants along with staff effort.

Briefly Noted . . .

In Denver an urban section of an Interstate highway was investigated for two alternate routes. The west 48th avenue route would cost $11,253,000, another route to the north $10,962,000. The state highway department engineers reported that the slightly more costly route would be 1,800 ft. shorter, and would bring a saving of $510,000 per year to motorists for this reason —enough to amortize a 3%, 30-year bond issue of $10 million.

This is the kind of economics which needs thorough working out everywhere these days. Such facts can help sell the citizens on the route which will serve them best over the long pull.

●

A thirteenth juror sat on the Illinois road scandals, which recently resulted in the bribery conviction of highway department aids of the former governor. His name was Federal Aid.

●

How many miles of Michigan's 5-year expressway program will be paved with concrete, and how many with asphalt? Commissioner Mackie's recent announcement on this may have been based on engineering evaluation, but one ingredient, the political headache, was omitted in the estimates.

LOOK AT THE No. 977 LOAD OVER 18 TONS IN 4 MINUTES— ALL DAY LONG!

This is a road construction job between Durham and Chapel Hill, N. C. Loading sand for Nello L. Teer Co. is this Caterpillar No. 977 Traxcavator, averaging 18.4 tons per load. Its load time per truck is 4 minutes, timed right on the job. Supt. R. G. Moore states flatly: "Best truck loader there is."

A few reasons: the No. 977's track roller frames are extended for better stability; its 2¼ cu. yd. bucket tilts back 40 degrees at ground level, giving leverage at the cutting edge and preventing spillage; operator sits high and comfortable, out of the dust, with all controls conveniently at hand.

New with the No. 977: a Side Dump Bucket attachment (2¼ cu. yd.) that dumps to the left as well as forward and is directly interchangeable (same pins, bolts, nuts) with the standard bucket.

But don't just look at pictures—look at the dirt fly on your own job when a Cat No. 977 Traxcavator digs in. Call your Caterpillar Dealer right now and set up an eye-opening, truck-filling demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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FOR FAST LOADING

LOOK FOR YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

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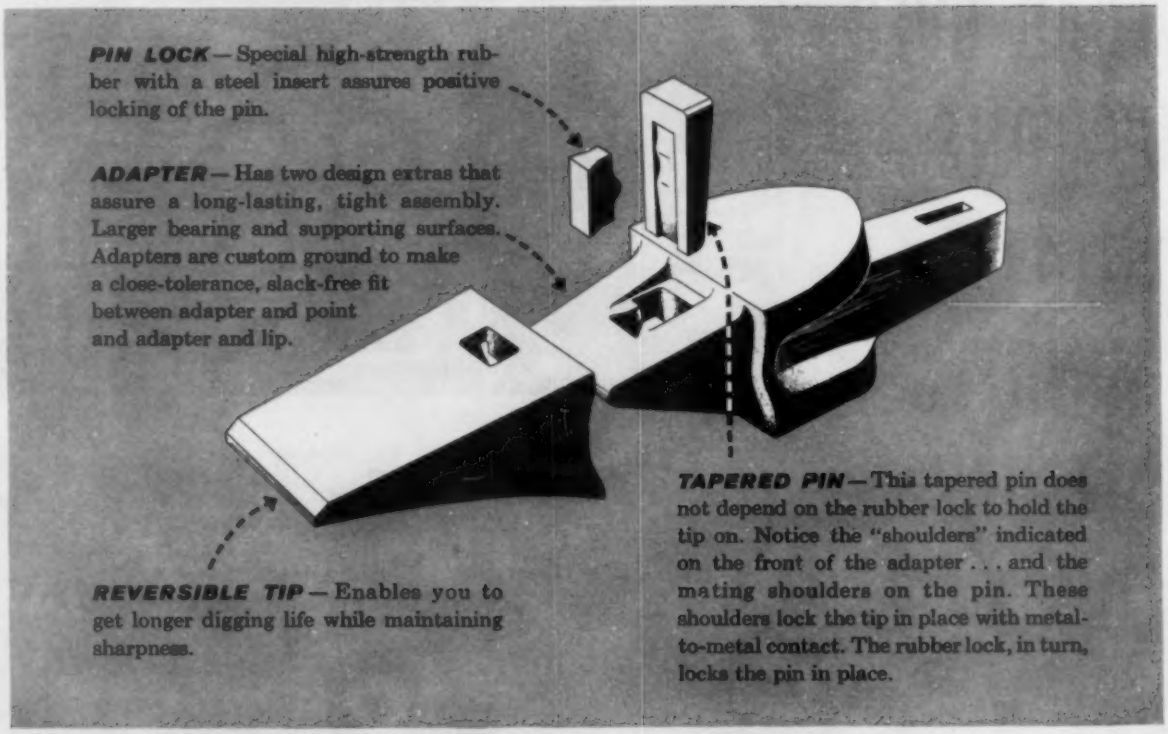
NEW AMSCO® 2 PART TOOTH


PIN LOCK — Special high-strength rubber with a steel insert assures positive locking of the pin.
ADAPTER — Has two design extras that assure a long-lasting, tight assembly. Larger bearing and supporting surfaces. Adapters are custom ground to make a close-tolerance, slack-free fit between adapter and point and adapter and lip.
REVERSIBLE TIP — Enables you to get longer digging life while maintaining sharpness.
TAPERED PIN — This tapered pin does not depend on the rubber lock to hold the tip on. Notice the "shoulders" indicated on the front of the adapter . . . and the mating shoulders on the pin. These shoulders lock the tip in place with metal-to-metal contact. The rubber lock, in turn, locks the pin in place.

3 big features for fewer shovel shutdowns

1 You get up to four times extra wear over other 2-part teeth. We cast these new teeth of a tougher, new and special heat-treated alloy that slashes your replacement and maintenance costs.

2 These reversible teeth stay sharp, to penetrate cleanly and easily without straining your shovel. Reversing point is easy. This reversible feature is particularly important on corner teeth. It maintains digging efficiency throughout tooth life.

3 Positive locking device — Amsco's unique pin-locking design secures tip to adapter in tight, positive, metal-to-metal contact.

Order the Amsco 2-part Simplex from your local power shovel dealer.

AMERICAN Brake Shoe COMPANY

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American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

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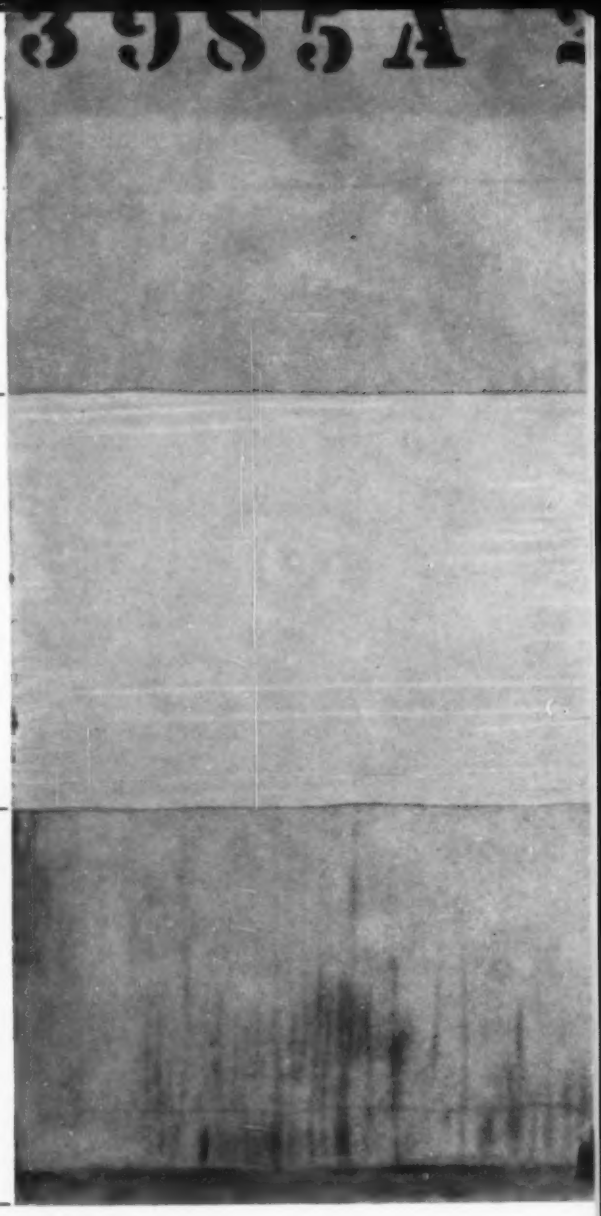
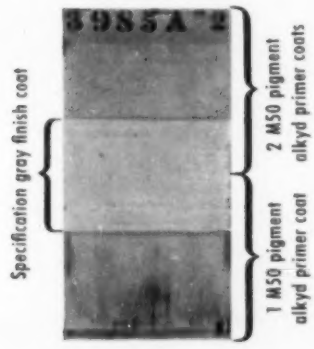
Area shaded from sun by wooden panel holder

After 9 years exposure, fading has barely begun to show in this 3-mil *M50* primer coat. Same type paint made with standard rust inhibiting pigment chalked and showed rusting in less than half this time.

Unshaded area



How test paints shown at right were applied



Exposed 9 years 45°S
Each coat 1.5 mils

1.5 mil M50 primer coat is still in place, still actively resisting corrosion after 9 years. Same type paint made with conventional pigment almost completely disappeared in the same period.

Proof M50 pigment Defense in Depth paints deliver lasting weather resistance

Never before such durable metal protection for highway bridges, guard posts, railings, sign posts. And never before such attractive color choices.

Here you see how typical M50 pigment primer coats weather 9 years exposure. The advantages of weather resistance like this in the primer coat of an anti-corrosive paint system cannot be overstressed. Long after weather has worked its way through intermediate and finish coats, primers made with *M50* basic lead silico chromate pigment* still provide excellent weather protection. Rust inhibiting action in the film continues unchecked. Even breaks in top coats traceable to damage or painting mishaps do little harm.

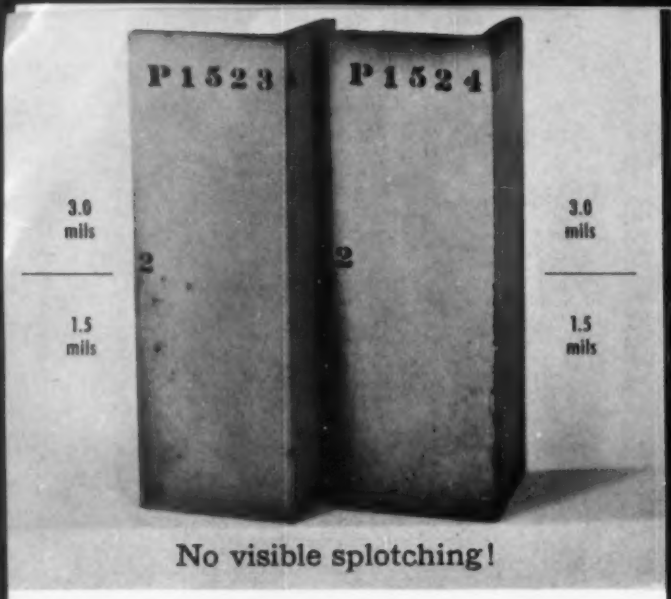
The excellent chalk resistance shown by *M50* pigment primers also pays off handsomely. When steel erection is delayed, repreparation of the steel is rarely needed. On-the-job spot priming is sharply reduced.

On the next page, see how typical M50 *finish* paints perform in severe exposure tests.

*Registered trademark of

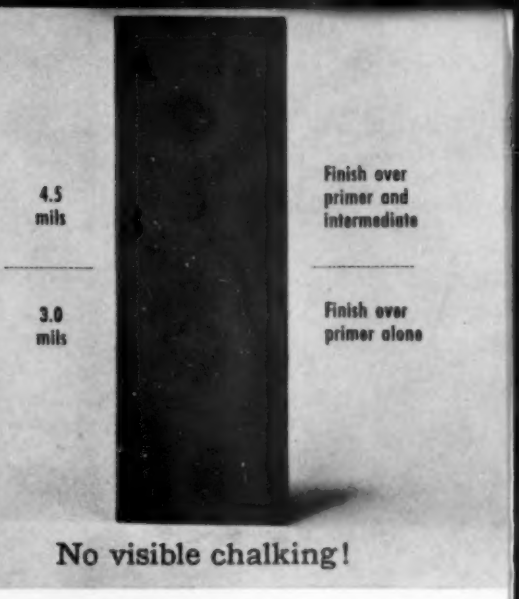
National Lead Company

General Offices: 111 Broadway, New York 6, N.Y.



No visible splotching!

Test angles above show how a typical *M50* pigment finish paint applied directly to steel (no primer or intermediate) withstands 4 years exposure in industrial atmospheres. Left, *M50* pigment finish applied on rusted surface with retained mill scale. Right, same paint applied on clean, sand-blasted surface.



No visible chalking!

This test angle demonstrates the excellent resistance to chalking or fading shown by *M50* pigment Defense in Depth paints. Paint has been exposed 2 years, 45°S in normal atmosphere. The insolubility and stability of *M50* fused lead chromate pigment contributes substantially to this performance.

Here are two performance plusses you can expect from M50 anti-corrosive finish paints exposed to weather

With *M50** pigment Defense in Depth paints, *lasting* weather resistance is obtained in *all* coats . . . not just intermediates and finishes. This is clearly brought out by exposure tests such as the ones shown on this and the preceding page.

Along with lasting 3-deep weather resistance, *M50* pigment anti-corrosive paint systems give you 3-deep rust inhibition and 3-deep color choice. Never before has it been possible to produce specification anti-corrosive paints with comparable performances that could be sold at current market levels.

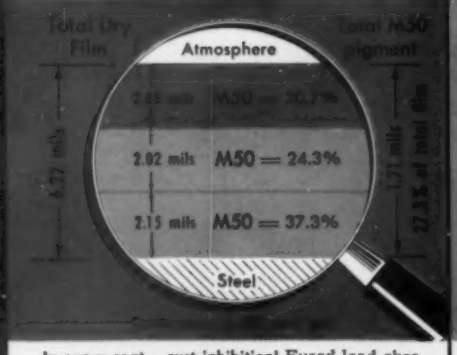
Now, with National Lead's *M50* pigment, most paint makers can make such paints.

National Lead is prepared to help your supplier formulate *M50* pigment paints and also: (1) show you *M50* pigment paint exposure test panels at its Sayville, L. I. Test Station; (2) send you a 24-page descriptive brochure, "Defense in Depth." (Mail coupon below); (3) provide technical aid in test applications; (4) help you develop suitable specifications for paints containing *M50* pigment.

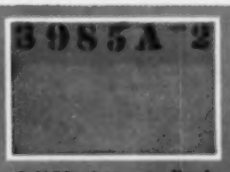
For M50 pigment paints themselves, contact your regular suppliers.

*National Lead Company trademark for a basic lead silico chromate pigment

Why M50 Defense in Depth paints give you metal protection beyond all former concepts



In every coat...rust inhibition! Fused lead chromate is noted for rust-inhibition. The *M50* pigment particle structure permits paint makers to include large proportions of lead chromate in all coats of anti-corrosive systems.



2 M50 pigment alkyd primer coats
Exposed 9 yrs 45°S
Each coat 1.5 mils dry film

M50 pigment finish put on rusty steel
Exposed 4 yrs 45°S
In industrial atmosphere

In every coat . . . weather resistance! *M50* pigment is insoluble in water and has the excellent tint retention properties of fused lead chromate. Unlike other rust inhibitors, it actually boosts weather resistance of paints.

In every coat...your choice of colors! *M50* pigment gets along well with most tinting pigments, permits paint makers a wide range of colors...not only in intermediates and finishes but in primer coats as well. Colors stay true.

M50 Defense in Depth

National Lead Company,
111 Broadway, New York 6, N. Y.

Gentlemen: Please send me your 24-page brochure, "Defense in Depth." Include color card of the six *M50* pigment paints you recommend for steel highway structures.

Name_____ Title_____

Firm or Dept_____

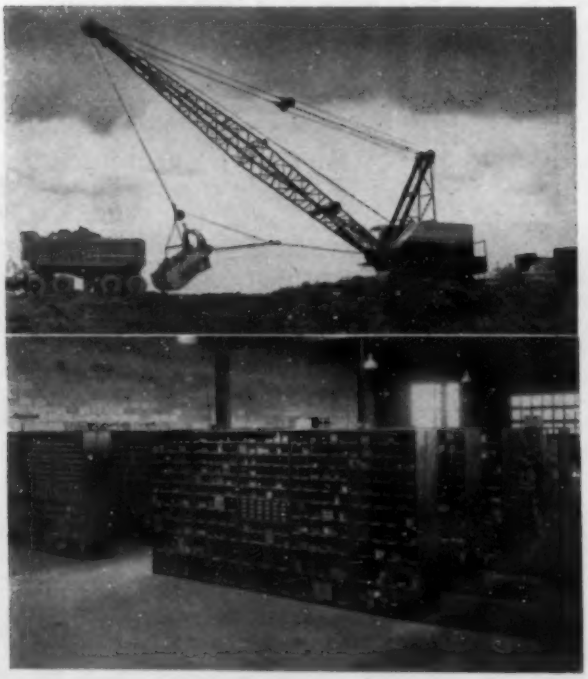
Address_____

City_____ State_____

Three Bucyrus-Erie 54-Bs and a 38-B (in background) keep haul units on the go as they load clay borrow material for the Tri-State Tollway. Two other 54-Bs are working at this location. On another section of the tollway are a Bucyrus-Erie 30-B crane, 38-B clamshell, and 38-B pile driver.

TRI-STATE TOLLWAY Contractors Profit from Bucyrus-Erie Team Action

At Hillsdale, Ill., this 54-B excavates fill for the new roadway. The deep box-section construction of the boom provides great strength with minimum weight. Wide spread feet are built to take the whip of fast operation.



Despite unfavorable conditions in construction of the Tri-State Tollway bypassing Chicago, fleets of Bucyrus-Eries are helping to keep the work on schedule. The Bucyrus-Eries pictured here are digging clay borrow on a section of the Tollway south of O'Hare International Airport.

Excavation at this site amounts to about a million yards. Plans call for turning the resulting pit into a lake for the Maywood Sportsmen's Club after all material has been removed.

Such characteristic Bucyrus-Erie features as low maintenance and day-in day-out dependability help contractors on the Tri-State Tollway get the most for their operating dollars.

See for yourself! Watch Bucyrus-Eries in action. Then contact your nearby Bucyrus-Erie distributor for all the facts. The sooner you do, the sooner you can enjoy the benefits that only Bucyrus-Eries offer! 476158

For continued BUCYRUS-ERIE performance on your construction jobs, INSIST ON ORIGINAL EQUIPMENT PARTS FOR YOUR MACHINE. See your nearby Bucyrus-Erie distributor.

A Familiar Sign... BUCYRUS ERIE *...at Scenes of Progress*

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

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From one to a fleet

with Allis-Chalmers Construction Machinery

Starting with a single tractor-dozer in 1949, R. Sam Krage Company of Sioux City, Iowa, now owns a fleet of Allis-Chalmers construction machines. Sam Krage attributes much of his success as a dirt mover to the operation and performance of his equipment, and to the top-notch service his Allis-Chalmers dealer provides.

Sam Krage, Sioux City, Iowa

Big TS-360 motor scrapers are heaped to 20-yd capacity with help of the 225-hp HD-21 crawler tractor. Krage especially likes the ease with which these machines handle wet dirt.

Look ahead... *move ahead*...and stay ahead

Top production, day after day makes Allis-Chalmers tractor-dozers, like this HD-11 shown spreading fill, Krage's choice.

On air base job, the Forty Five motor grader kept haul roads smooth, allowing the TS-360's to travel safely at high speeds.

Top production record on a wide variety of jobs

From small farm pond and dam construction with his first tractor, Krage branched off into clearing work for highway contractors. Since then he has moved into highway grading himself, both in Iowa and South Dakota. He also has done levee work on the Missouri River, and most recently handled a big air base job at Sioux City.

In this wide range of construction jobs, Sam Krage says he has benefited from an outstanding "time-on-the-job" record from his Allis-Chalmers equipment. Best proof of his confidence is the well-balanced fleet of Allis-Chalmers machines he now owns . . . big motor scrapers, crawler tractors, pull scrapers, and heavy-duty motor grader.

A number of the motor scrapers are TS-260's—rated 11 yd struck, 14 yd heaped. On a recent 800,000-yd highway job in Iowa, Krage says, these machines loaded, hauled and dumped at the rate of 55 trips an hour on a 1,400-ft haul. On the Sioux City air base job, his TS-360's (15 yd struck, 20 yd heaped) handled 450 loads a day on average hauls of 1,600 ft.

Krage's teams of HD-21's and TS-360's kept production rolling on a night operation at Sioux City air base.

Easy handling makes a big hit with operators

Krage says his operators like the way their Allis-Chalmers equipment handles, and that means extra production.

On the air base job, they were able to utilize the top horsepower-per-yard ratios in the TS-360's and TS-260's. Results—even in wet material, they loaded and hauled easily . . . and with positive, forced ejection, plus high apron opening, unloaded fast and clean.

Features designed for the operator's benefit on Allis-Chalmers tractors and motor graders are also considered important by Krage and his men. Torque converter drive on the HD-21 and HD-16 crawler tractors . . . and new toggle-type controls on the Forty Five motor grader are two examples. Both have the same effect—easier operation, more production.

Proved quality in parts and dealer service important factor

Sam Krage made his first extensive purchase of Allis-Chalmers equipment in 1952, was so well satisfied with its operation and performance that he has continued to purchase it.

Krage says that parts availability and prompt dealer service figure high with him in purchasing the type of equipment he needs in his work. In both respects he's had extremely good relations with his Allis-Chalmers dealer.

Your local Allis-Chalmers construction machinery dealer is ready to help you with equipment and application recommendations, around-the-clock parts and service. Call him now for a working demonstration of the performance that sold Sam Krage. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

with ALLIS-CHALMERS

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● Four-foot fan provides draft for burning of stubborn log pile; famous "4th of July" tunnel in background. Le Roi B 91 engine with Twin Disc clutch.

● IEL Super Pioneer drill is an adaptation of a McCullough chain saw—here using earth auger to find bottom for culvert in creek bed. Drill mounted on Dodge 4 by 4 power wagon.

Engineers and Contractors

Both Get Hazing On . . .

By H. K. Glidden,

Contributing Editor to *Roads and Streets*

Mountains, timber, rock and fast storm-water runoff pose problems for both the engineers and the contractors on this 4-lane expressway through north-country wilderness.

The launching of Interstate road construction in Idaho in 1956, immediately produced the highway department's largest single contract up to that time. The price including change orders was well over $3 million for the 7.2-mile section of U.S. No. 10 east of Coeur D'Alene.

Few areas more severely test the feasibility of maintaining Interstate design standards as this mountainous section. Except for a small portion on the east end, there is not a single piece of tangent longer than a hundred feet or so. In most instances alternate curves are in opposite directions although all curves are adequately spiraled. A minimum separation of 6 ft. between opposing lanes prevails throughout the project.

The deepest fill is about 80 ft. and the sharpest curve is 6 degrees.

The contract was awarded in October, 1956, to the Fred H. Slate Company and E. C. Hall Company, in joint venture, both of Portland, Oregon. These two firms combined a great deal of construction know-how. Hall was mainly concerned with crushing aggregate, while Slate Company was well-equipped for the clearing, grading and culverts.

The hot-mix asphaltic concrete pavement was subcontracted to the J. C. Compton Company, of McMinnville, Oregon. This company installed a Madsen asphalt plant at approximately the center of the project, for paving during the 1958 summer, with a September, 1958 completion date.

● Northwest 80D shovel with 2½-yd. Esco bucket loading rock into end dump Euclid in heavy traffic.

● Northwest 80D shovel loads Tournatrailers to feed crusher utilizing one 32 x 40 Pioneer jaw crusher, two 4-ft. Telesmith gyratory crushers, three sets of 22 x 40 Pioneer rolls; power from two Cat 397 (300 kw) generators.

● Gardner-Denver Air Trac drill sinking 40-ft. holes for aggregate supply.

Idaho's First Interstate Project

Major bid items were: 1,500 cu. yd. of unclassified excavation (30 percent rock) at 82 cents; 3,050 tons of penetration asphalt and 55,300 tons of rock for class B and D hot mix, plus 155,000 tons crushed base material and a great deal of pipe.

Corrugated metal pipe of almost all sizes included one line of 8-gauge corrugated plate, 10′ 11″ by 7′1″. Metal pipe, except arches, are bituminous coated inside and outside.

● *Tough Locating.* Due to the heavily timbered mountainous terrain, it was practically impossible to make a direct location. For this reason a topographic map was prepared from cross sections on lines run on both sides of the canyon and final location was projected on the map. Quantities were then computed from the contours. After the contractor had cleared the new alignment, it was then possible to estimate quantities much closer than could be done from the contour map. This resulted in considerable redesign of the grades, but proved satisfactory and unquestionably a great time-saver.

Experience with drilling test holes in this mountainous terrain of faulted rock, resulted in the purchase of diamond drill equipment. The district office engineers very carefully ran test holes along all sections of the right-of-way where cuts were expected. Effort was made to determine whether any rock encountered was solid or merely a large boulder. Despite this, when actual excavation was undertaken along mountain slopes, it was soon determined that much of what had been considered solid rock was based on the test auger having hit the top of a larger rock. The accompanying photograph, which shows a D9 Cat dozer working in a cut, illustrates the extent of rock in some sections.

Other pictures show the drill equipment in operation mounted on a Dodge 4 by 4 power wagon. The drill is an adaptation of a chain saw rig. The saw used is an IEL Super Pioneer. The original soil auger was supplemented with a ¾-in. diamond core bit. The district office used both Hoffman and Christiansen bits. For the purpose of cooling the diamond core drill, the department purchased a Robbins S. Myers pump, model No. ECG 22. The diamond drill used was purchased from the Diamond Drill Contracting Company of Spokane, Wash. The drill was mounted on a 6 x 4 in. channel section bolted to the front bumper of the Dodge power wagon. Hole depths to 50 ft. were required in this exceptionally thorough subsurface exploration for location and design purpose.

Early experience with this drill indicated the need for a more rigid hitch to the truck. Credit is due the District 5 personnel for ingenuity in mounting and operating this equipment effectively.

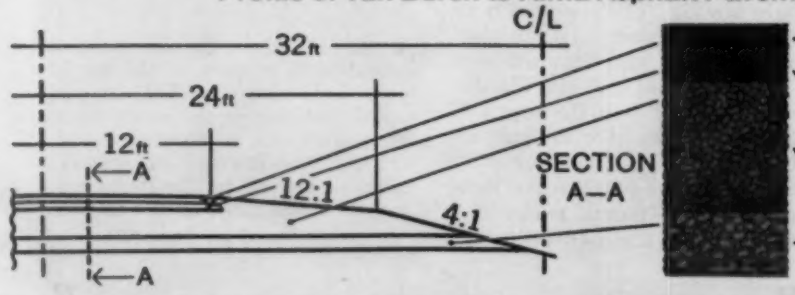
The nature of the excavated material, about 30 per cent rock with many large boulders, made it completely impracticable to use rollers for compaction. Heavy equipment tracks produced 100 to 108 percent of standard density throughout.

● *Special Culvert Paving.* After a considerable portion of the metal pipe had been installed, it was noted that due to the steep transverse grade—the heavy run-off and the unusual amount of granual material carried by the storm water—there was liable to be excessive

(Continued on page 80)

Asphalt-paved lanes of Arkansas' modernized

Profile of Van Buren to Alma Asphalt Pavement Design

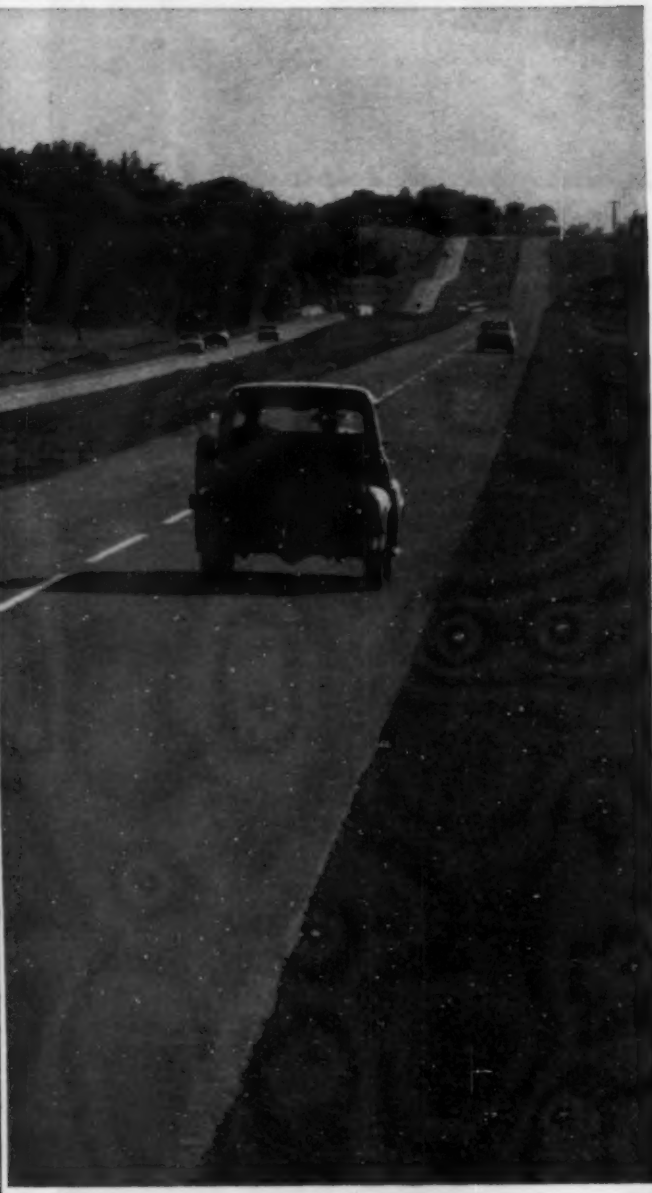


1 1/2-inch SURFACE COURSE:
Arkansas State Highway Department Asphaltic-Concrete Hot-Mix Surface Course —Type 3.

2-inch BINDER COURSE:
Arkansas State Highway Department Asphaltic-Concrete Hot-Mix Base Course—Type 2.

12-inch BASE COURSE:
8-inch crushed stone base over 4-inch selected sub-base. (P. I. not to exceed 3)

U. S. Route 64 prove their durability!



. . . only 12 man-days maintenance in first five years of service

During their first five years of traffic, the rugged Asphalt-paved lanes of U. S. Route 64 (dualized in 1953) between Van Buren and Alma, Arkansas have required *only* 12 man-days of maintenance.

This pavement handles over 700 heavy trucks and 5,000 other vehicles daily. The Asphaltic concrete has remained in almost perfect condition.

When new type, heavy-duty Asphaltic concrete roads are designed like this one . . . to take into account prevailing soil, climate and traffic conditions . . . you can expect many years of trouble-free service. That's because rugged Asphaltic concrete has the resilience to absorb impact and to adjust to sub-grade settlements.

What's more, suitable aggregates often can be found on or near the right-of-way. Ordinarily you can expect bids for a modern, Asphaltic concrete road to run from 10% to 50% LESS than for rigid construction.*

By using heavy-duty Asphaltic concrete any state can pave . . . *and maintain* . . . more and better roads with its tax dollars. This is the fundamental on which designers of many of today's outstanding roads have built their reputations . . . roads like the New Jersey, Will Rogers, Kansas and New Hampshire Turnpikes . . . and many others.

**Saves from $11,768 to $92,628 per mile. Write for details.*

$2.80 per square yard! That's all it cost to lay this modern, flexible, Asphaltic concrete portion of U.S. 64.

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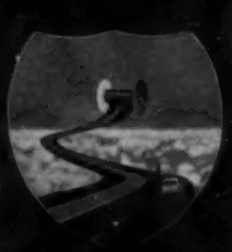


Ribbons of velvet smoothness...
ASPHALT-paved Interstate Highways

Camera Trip Over the Idaho US 10 Job

(Continued from page 77)

● **On the U. S. 10 job—the Idaho highway department's materials laboratory trailer one of several purchased for the various districts.**

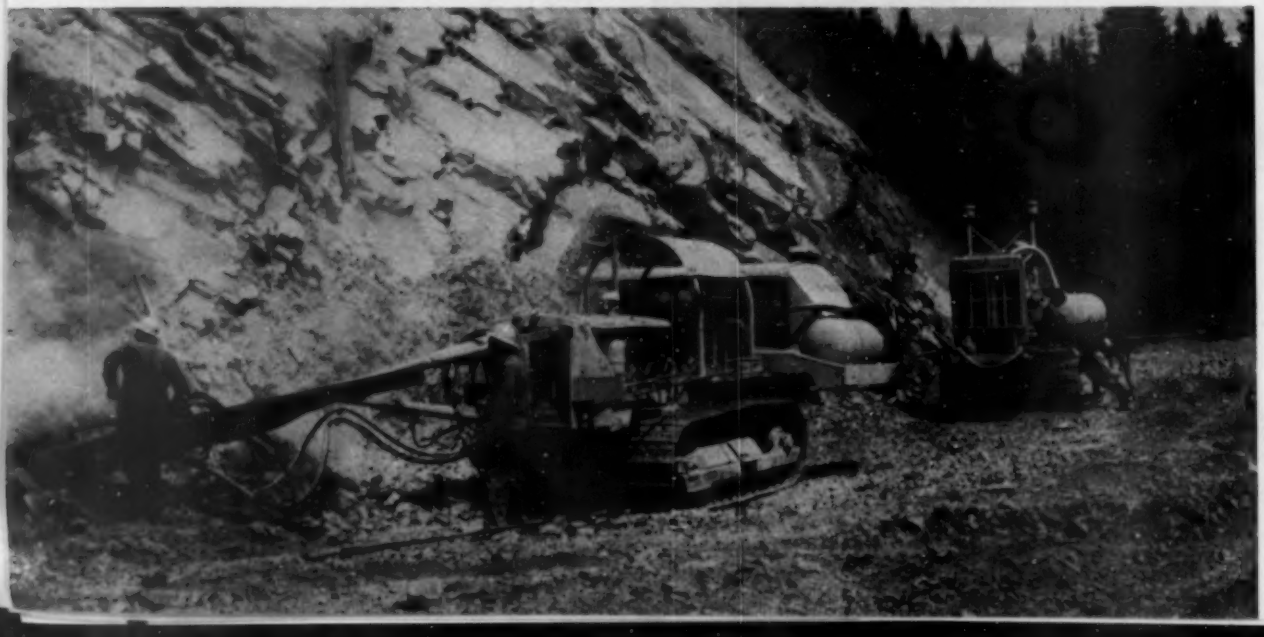
● **Cat D9 demonstrates its ripping power teaming up U-dozer pictured in adjacent scene.**

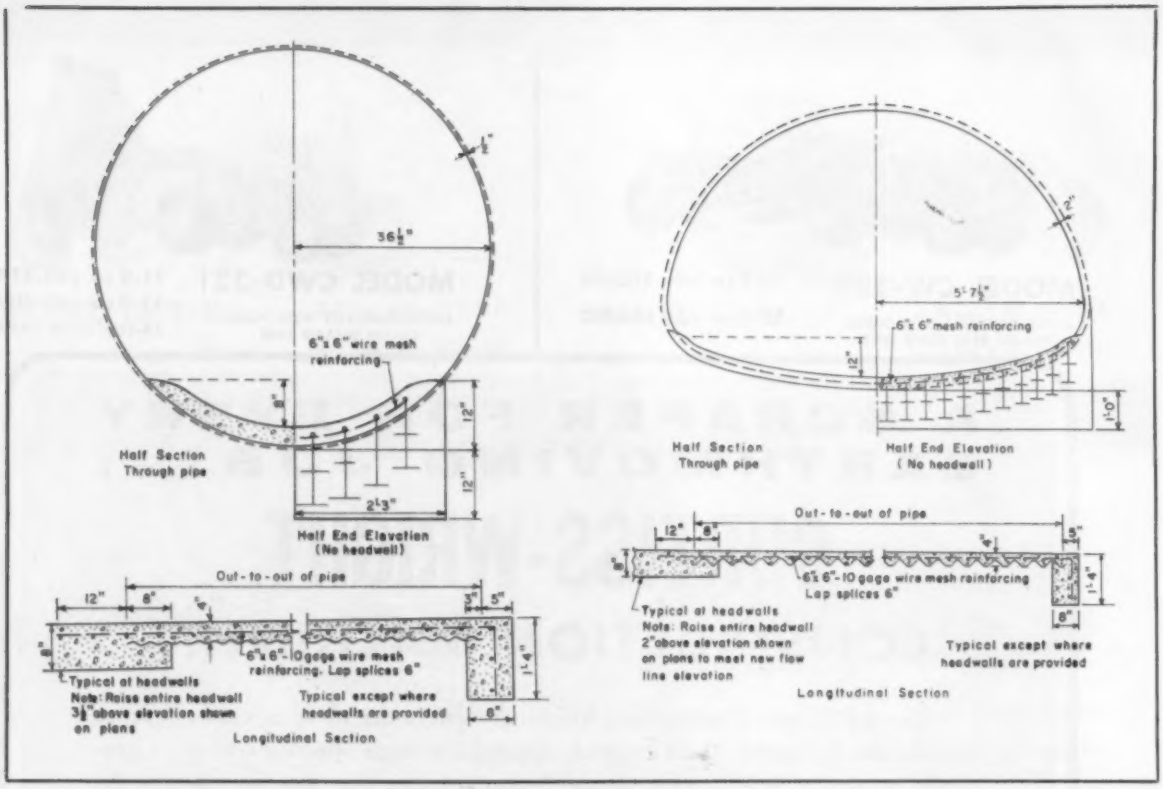
● **Cat D9 U-dozer works 50 percent rock material in cut, moving tremendous yardage unassisted on downhill push.**

erosion of the pipe inverts. Armco engineers recommended that a heavier gauge metal be used, but this change-over was not considered practical at the time the condition was discovered. The district office engineers working with Armco's engineers, designed a concrete paving for the inverts of all large pipe, including 72-in. pipe and pipe arches. Concrete reinforced by 6x6 wire mesh was placed to maximum 4-in. thickness measured from bottom of corrugations. Headwalls were added at culvert entrances and cutoff walls at outlets.

This limited access highway was fenced with 4-strand barbed wire through private property. The right-of-way however chiefly traverses public forest land where fencing is not needed.

● **Many rock cuts required heavy blasting. Cat D8 in the foreground mounts Ingersoll-Rand 600 Gyro-Flo rotary compressor and Gardner-Denver 121 drill on Joy boom. The D8 in the background carried a similar drill with Gardner-Denver WBK 4006 compressor, Drilling 3½-in. holes with Timken bits, the units drilled 75 to 80 ft. vertical holes. In this photo they are drilling 35-ft lifter holes approximately at grade extending 2½ ft. past toe of cut.**





● **Two examples of large-diameter Armco Multi-plate pipe arches which were given special invert paving, under a change order, due to the exceptional conditions.**

● *Aggregate Problems.* Idaho highway specifications require hot-mix aggregate to contain 40 percent of minus No. 4 material. Contractors who have worked with the Idaho specification appear to have little trouble securing specification material, but contractors from out of the state complain that the specifications are very tight.

Personnel of E. C. Hall Company were faced with a major decision in deciding where to set up crushing operations. They had their choice of some very hard quartz rock located midway along the project, as against a basaltic material requiring a 7-mile haul. The basaltic material was selected, despite the haul, because of lower drilling costs.

The accompanying photographs and crusher diagram illustrate the salient points in this complicated all-electric set-up. It will be noted that the quarry is closely adjacent to the first crusher unit which allows a Northwest 80D shovel to load three 12-ton Tournatrailers with sufficient rapidity to keep the crusher operating.

The general design principle of the crusher layout is to first pass the quarry material through a Pioneer 32 x 40 jaw crusher. The Tournatrailers discharge from the end onto a 20′ x 60″ contractor-built feeder belt.

The material goes then into a surge pile and is routed alternately through Telesmith cone and Pioneer roll crushers, being shunted back and forth with specification material removed and sent to the storage bin at every opportunity. The production goal has been 150 tons per hour.

Quarry drilling which has continued into the 1958 season util-

(Continued on Page 85)

● **Workmen use nozzle combining compressed air and water to clean floor of Armco multiplate, preparatory to placing special concrete paving. Watching are Kurt Luerzer, resident engineer, and Dwayne Ammens, bridge subcontractor.**

MODEL CW-320

INTERCHANGEABLE WITH MODEL CWD-321 REAR DUMP UNIT

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

MODEL CWD-321

INTERCHANGEABLE WITH MODEL CW-320 SCRAPER UNIT

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31.0 cu. yds. HEAPED
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AVAILABLE IN 10.0 and 13.5 CU. YDS.

MODEL CW-27

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10.0 cu. yds. HEAPED

MODEL CWT-15

15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED

MODEL CW-215

INTERCHANGEABLE WITH MODEL CWD-214 REAR DUMP UNIT

15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED

MODEL CWT-20

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

MODEL CW-220

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

MODEL CWT-26

26.0 cu. yds. STRUCK
33.0 cu. yds. HEAPED

MODEL CW-226

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

26.0 cu. yds. STRUCK
36.0 cu. yds. HEAPED

Sloped trench licks cave-ins on Denver waterline

Digging 6 feet deep in loose sandy loam, this Cleveland 240 sloped trench from 90-inch top width to 34-inch bottom width, eliminating serious cave-ins. Picture shows its 30-inch wide, power-shift conveyor easily discharging the large-volume spoil.

Owner Fred Linneman of Denver uses his versatile 240 on many different types of trenching jobs, averages 20 feet of trench per minute on small mains and service lines in this area. Transport is no problem since the 240 is only 8 feet wide overall and its conveyor power folds to within this width.

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● The Telesmith cone crusher (springs of which are visible, upper left) and Pioneer No. 402 roll crusher—part of the final crushing unit discharging into the storage bin.

● LeT-Wesco 12-yd. Tournatrailer dumping onto homemade conveyor, which discharges into a 32 x 40 Pioneer jaw crusher.

Aggregates for the Idaho U. S. 10 Project

Percent Passing Screens

Type	1"	¾"	⅜"	No. 4	No. 10	No. 200	Amount
1" max. base	100			40-60		3-9	91,000 tons
¾" max. base		100		45-65		4-9	83,000 tons
Class "B" for plant mix		100		50-60	30-40	2-8	26,800 tons
Class "D" for plant mix			100	55-70	30-50	4-10	28,500 tons

(Continued from page 81)

izes a Gardner-Denver Air Trac drill, with Gardner-Denver 500 compressor. Three-inch drill holes 40 ft. deep are on 12-ft. spacing. Hole load consists typically of 3¼ 50-lb. boxes of Pacific 40 percent free flowing dynamite with delay shooting.

This project is under Idaho highway district No. 5, A. J. Sachse, district engineer, Kurt Luerzer, resident engineer, W. F. Essley grading inspector, L. C. Spurgeon office engineer, and R. D. Harris on instrument work. James Leinbach is general superintendent for the contractors, assisted by Doug Luna, with Brownie Yoder as crusher superintendent for Hall. G. Bryce Bennett is Idaho's State highway engineer.

Swiveling Crane Put To Many Job Uses

Shown here is the skip being attached to a concrete paver, following minor repairs, as photographed on the project of George M. Brewster and Son, Inc., at Griffiss Air Force Base, Rome, New York.

The machine pictured is an Austin-Western hydraulic crane. This crane routinely was in use for handling and resetting the heavy paving form sections for this runway job involving 16 inch slab.

High Speed Screening Plant

This high-output portable screening plant for pit run base material was set up in only 4 to 6 hours. The Noble plant was erected to produce 500,000 tons of minus 3 in. base material for runway construction at Mather Air Force Base, Sacramento, Calif. Its production rate: up to 850 tons per hour.

To reduce hauling distanct within the pit itself as the quarry site changes, Gordon H. Ball Co., contractor, moves the plant within the pit easily. Plant is charged with rock up to 10 in. size by dozer. Conveyor, hopper and screen components of plant are transported o the highway by two trucks.

● Austin-Western hydraulic crane helping to fasten a repaired skip back on the paver.

Angelo F. Ghiglione

Alaska . . Big

Some Day, Yes. But the Problems are Formidable

A Roads and Streets' *interview with Angelo F. Ghiglione, veteran Alaska highway engineer who served as Commissioner of Roads for the territory from 1952 to 1957.*

WHEN the U. S. Congress voted to admit Alaska to the Union this summer, the action stimulated a wave of interest in the 49th state, unmatched since Gold Rush days. Road builders are interested particularly in Alaska's highway system, what it is today and its promise as a potential market for contracting services, materials and equipment.

Alaska itself is a vast, largely unsurveyed domain, beneath which lies a fabulous reservoir of natural resources—oil, precious metals, coal, and 31 of the 33 minerals which the United States considers strategic in case of war. On the surface it is, to a large extent, "treeless tundra, mountains, glaciers, rivers, swamps and islands." The centers of civilization are few and scattered even after these many years of American occupation.

To give *Roads and Streets* readers a glimpse into the importance of highways to Alaska and the prospects for future road-building there, we asked Duane L. Cronk, Director of Highway Information Services in Washington, D. C., to interview Angelo F. Ghiglione, who for 25 years served as a highway engineer in Alaska, and who was Commissioner of Roads for the Territory from 1952 to 1957.

Mr. Ghiglione, who holds a Master's Degree from Massachusetts Institute of Technology, and is the recognized international authority on problems of permafrost, is intimately acquainted with the Alaska highway situation. He is now serving as Resident Engineer for Region 15 of the U. S. Bureau of Public Roads outside Washington, D. C.

Here are some of his observations:

Q. Mr. Ghiglione, what are some of the reasons why Alaska has remained a "frontier" region so long?

A. We have been up against several extreme natural handicaps in Alaska. One of these, of course, is weather. It is true that parts of the region enjoy a relatively merciful climate, but one-third of the new state lies north of the Arctic circle and large areas are subject to extreme cold, short summers, and no means of communication. The southern coastal areas experience over 100 inches of rainfall a year.

I would say, however, that the lack of roads has been one of the major deterrents to rapid development. Alaska is a large area, you know. It is roughly one-fifth the size of the entire United States. But its cities are few and widely scattered, and many are still accessible by sea and air only. So transportation is a major bottleneck.

Commodities must be transported to some inland frontier cities—which are almost islands in the wilderness—by air. Of course, this is costly and time-consuming, and Alaska officials are agreed that if the frontier is to be broken, and if the vast undeveloped areas are to be developed, cheaper, speedier access to the interior must be provided. Highways seem to provide a natural solution, of course. So we anticipate the role of the highway engineer will become of increasing importance to Alaska in the years just ahead.

Road Contracting Opportunity ?

Q. Mr. Ghiglione, describe briefly for us the extent of the present Alaska highway system.

A. At present Alaska has about 5,000 miles of roads. Less than 2,000 of these are paved, and, incidentally, most of this mileage has been paved within the last 10 years.

Q. How did this "skeleton" system develop?

A. Rather piecemeal, as here in the States. First, "pioneer" roads were cut through to open up new territory and to connect forts along the rivers; later, to provide vital interconnecting links from sea and river transportation systems to villages and mining areas, and also to serve as feeders to the railroad. Many roads, like most American roads in the early days, began and ended in the "middle of nowhere." They were isolated segments of highways for local use only. For instance, it was impossible to drive far out of such cities as Anchorage or Fairbanks.

A primary highway system has emerged only in very recent years, connecting the largest cities and establishing contact with major ports and railheads.

Q. What sort of road building has taken place in the last decade?

A. In 1948 the military began to take an interest in closing the gap in Alaska's highway system. (We built major defense installations up there during and since World War II.) At that time the Defense Department began to support larger appropriations for the Alaska Road Commission, which was then under the Department of Interior. There were no hard-surfaced roads 10 years ago, but under military encouragement, road building expenditures reached a high of $30 million a year, of which about $20 million went into new construction. A number of U. S. contractors came up there to bid for this work and accomplished it in very fine style. Within the last few years, as the defense objective was met, those expenditures have dropped off.

Q. How does Alaska share in the federal-aid highway program?

A. Alaska got a real break in the 1956 Federal Aid Highway Act when Congress recognized its internal transportation problem, and made it eligible for Federal aid. Whereas the other states must match Federal aid on a 50-50 basis, Alaska, because of its large proportion of public lands, is required to put up only 10 percent. In addition, Federal aid may be used for maintenance, which is a major item there, as well as for new construction. This assures Alaska of a continued increase in road building.

Q. How much money is Alaska receiving for roadbuilding now?

A. The new state will have about $20 million to spend there this fiscal year. This compares with $13.1 million available the last year under the Interior Department appropriations.

Q. How is statehood likely to affect the future volume of highway construction in Alaska? What are the foreseeable prospects for the highway industry there?

A. It is not likely that highway construction volume will increase significantly as a result of statehood right away. It is true there will be pressure to revise the formula under which Alaska receives Federal aid, to give Alaska more Federal assistance, when its Congressmen and Senators get to Washington. The present apportionment formula recognizes only one-third of Alaska's area, while considering the entire area of all other states. The local officials, of course, are well aware of the need for extension and improvement of the highway system and will push for a steady increase in expenditures for this purpose.

Q. What about more local funds for road building?

A. Alaskans are probably giving as much for this purpose as they can for a while. The state already has a 5-cent gasoline tax and, incidentally, Alaska law stipulates that all these revenues be earmarked for road work.

Q. What kind of highway department will be created to help the new state develop a real road system.

A. Administratively, Alaska's highway department is in good shape to greet statehood. Two years ago, the territorial government legislature passed a "model" highway act, creating a commis-

(continued on pag. 90)

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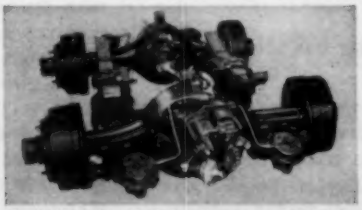
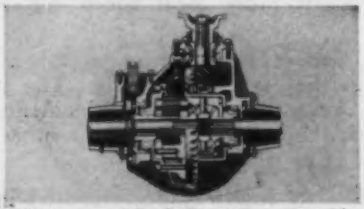
NEW Tractor Equipment Package provides complete trailer air brake and electrical connections, meets I.C.C. requirements.



NEW Ford Tilt Cab Tandems are available with three tandem-axle capacities: 28, 34, and 38,000 lb. Front axles to 15,000 lb.



NEW Faster Axle Ratios team up with Super Duty V-8's for greater gas economy and reduced engine wear. For example, 5.43/7.39 to 1 available in 1100 Series.

NEW 2-Shoe Brake (parking) is standard for '59 on all Ford Extra Heavies. Has 50% greater stopping and holding power, requires 50% less effort to operate.

Tilt Cab Tandem Ford C-950 (above) has hydraulic loader with push-button remote control.

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Up to 36,000-lb. GVW, 65,000-lb. GCW

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BRAND-NEW TILT CAB TANDEM FORDS for '59 combine the easier, more economical maintenance of tilts with high tandem-axle load capacities. Tilt design also permits higher front axle loads, longer body on given wheelbase. C-950 Tandem, above, operated by Fairlawn Supply and Concrete, Akron, has 15,000-lb. front axle, 34,000-lb. rear. Carries up to 6,500 brick, compared to 5,000 on a conventional tandem. Has 401-cu. in. V-8, 5-spd. main transmission, 3-spd. auxiliary, 201-in. wb. GCW (with pup trailer) 72,000 lb.

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ALASKA

(continued from page 87)

sion along lines recommended by the American Association of State Highway Officials. The Commissioners were given all the enlightened authority recommended for modern highway departments in regard to right-of-way acquisition, contract procedures, limited access highway design, and such matters. They have already been named. In the meantime, about 1,000 employees of the Bureau of Public Roads are carrying on. They, presumably, will become the nucleus of the new state highway department.

Q. Do contractors encounter any unusual construction problems in Alaska?

A. Oh yes, but nothing that they can't lick. The greatest problems contractors face are the extremely short working season, isolation, and permafrost. Long shut-down periods, poor communications, and great distance from populated areas, and long hauls for equipment run his costs up. He must provide camp and messing facilities for his entire crew, must carry large parts and material inventories, and take care of his key employees over long "off-season" periods.

The permafrost is the most unusual technical obstacle he encounters. This permanently frozen ground underlies approximately 80% of Alaska to depths of several hundred feet. The contractor can't handle it as either earth or rock. While in place, it is somewhat like rock and can be blasted or ripped in some instances. However because it thaws, it is unstable and can't be used in the grade. If permitted to thaw too far in advance of grading, frozen underzones create an impenetrable surface mire since the melt water cannot drain into the frozen ground below.

Since the permafrost changes shape with changing construction and climatic conditions, the final road is subject to heaving and settling for many years. This necessitates the use of only flexible pavements. Practically all highway paving in Alaska is with asphalt.

Q. We understand that maintenance is quite an operation in Alaska.

A. Maintenance is a continuing problem. Over half of our maintenance dollar goes into winter work —snow removal and ice control. We have, ranging from light to heavy, rock slides and other natural phenomena. A real problem is "frost heave." Melted water will run down from thawing areas into fissures between the seasonally frozen ground and the permafrost. It soon builds up a tremendous hydrostatic pressure and "explodes," causing landslides over the road, or even occurring under the road. We had such a freak explosion right under one of our equipment sheds once where the water erupted through the ground and filled the building. When we got up there in late spring, we found the inside of the building was a solid block of ice.

Snowfall in some mountain passes in Alaska runs from 600 to 960 inches a year. So, we have pioneered, along with certain Western U. S. states, in the technique of forecasting and triggering avalanches. Also, we have devised some unusual equipment to deal with the snow-removal problem. For example, the largest snow plows in the world are at work in Alaska. (These are 400 horse power rotary plows, developed first with Bros, Incorporated, mounted on Kenworth Model 888 off-highway trucks with a gross vehicle weight of 105,000 lb.) Heavy spring thaws and swollen streams cause considerable bank erosion and subject our bridges to rather harsh treatment. Icing, locally called "glaciers" requires ice-fencing, fire pots, and special drainage controls.

Q. Thank you, Mr. Ghiglione.

A. These are just a few of the things roadbuilders run into in Alaska. As the 49th state grows and expands its skeleton highway network, I'm sure we'll hear of rather fascinating projects getting underway and unusual contractor solutions in one of the most challenging areas the industry is called upon to work.

These Contractors Have Recently Done Road Work in Alaska

Contractors to whom highway construction projects in Alaska have been awarded during 1957-58 are listed below. Included are three contractors who are engaged in the construction of projects in Mt. McKinley National Park which were awarded by the National Park Service. All other projects were awarded directly by Public Roads. (Source: Bureau of Public Roads)

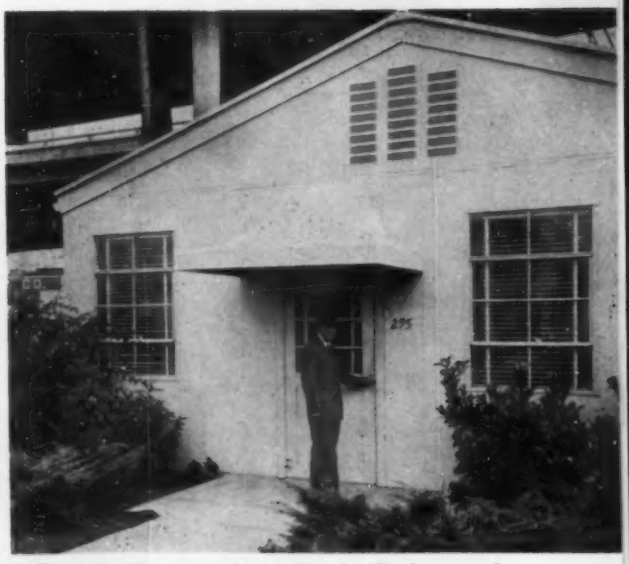
A & A Garage & Const., and Bronson Water Delivery, Nome, Alaska
Alderton, Roy E., Fairbanks, Alaska
Asphalt Paving Corporation, Anchorage, Alaska
B-E-C-K & Associates, Seattle, Washington
Cheney-Birch-Green, Seattle, Washington
Green Construction Company, Des Moines, Iowa
Keil & Peterman Co., Box 676, Ketchikan, Alaska
Mallow Construction Company, Box 337, Spenard, Alaska
McLaughlin, Inc., Box 1824, Great Falls, Montana
Mullen, S. S. Inc., Box 3886, Seattle 24, Washington
Nygren Construction Co., 3216 Government Way, Seattle, Washington
Pacific Construction Company, Box 1051, Fairbanks, Alaska
Rivers Bros. & Wright, Inc., Box 1894, Anchorage, Alaska
Rogers Constr. Co. & Babler Bros., 11760 Glisan St., N.E., Portland, Oregon
Sandstrom, Dale & Steinacker, Robert J., Box 640, Cordova, Alaska
Savage, C. H., Co., 4126 S.E. Milwaukee Ave., Portland, Oregon
Spendlove Construction Box 1313, Anchorage, Alaska
Stock & Grove, Inc., Box 2051, Anchorage, Alaska
Triplette & Trucana, Box 2562, Juneau, Alaska
United General Contractors, Inc., Box 397, Seattle, Washington
Williams Equipment Company, Box 1190, Fairbanks, Alaska

The highway program in Alaska as administered by the Bureau of Public Roads is indicated by the following totals of federal funds apportioned to Alaska for fiscal year 1960: Federal-aid primary $8,218,724; Federal-aid secondary $5,542,560; Federal-aid Urban $68,597; Forest highway $2,876,474.

Attractive Steel Maintenance Buildings Under Freeway Decks

By Ralph D. Kinsey,

Assistant District Engineer, California Division of Highways, San Francisco



● **Ralph D. Kinsey, Assistant District Engineer, and his attractive office.**

As we all know, acquisition of right-of-way in populated and industrial areas is an expensive though necessary part of the construction of a modern highway system.

This is the story of how opportunist District IV, California Division of Highway's utilized space under a freeway for a highway maintenance yard.

Construction of the famous Bayshore Freeway or "Skyway" through the eastern section of San Francisco required an elevated roadway in certain areas. Naturally, the state had to purchase the necessary right-of-way, but only for the highway over this land. It soon became evident that beneath these elevated structures was much available space. A unique plan was developed to utilize this space—by constructing maintenance facilities within the right-of-way and *beneath* the elevated roadway.

District IV engineers erected a number of Armco steel buildings between the piers supporting the roadway for the various housing requirements of a highway maintenance yard. These now include two buildings for equipment storage, a sign shop, a warehouse and shop, paint storage building, oil and grease storage, crew quarters and a yard office. Pre-designed steel buildings were chosen because of their versatility and ease of erection. In this yard District IV has located its headquarters for district-wide traffic stripping, bridge painting, landscaping and signing operations. Other yards throughout the district handle the other maintenance functions.

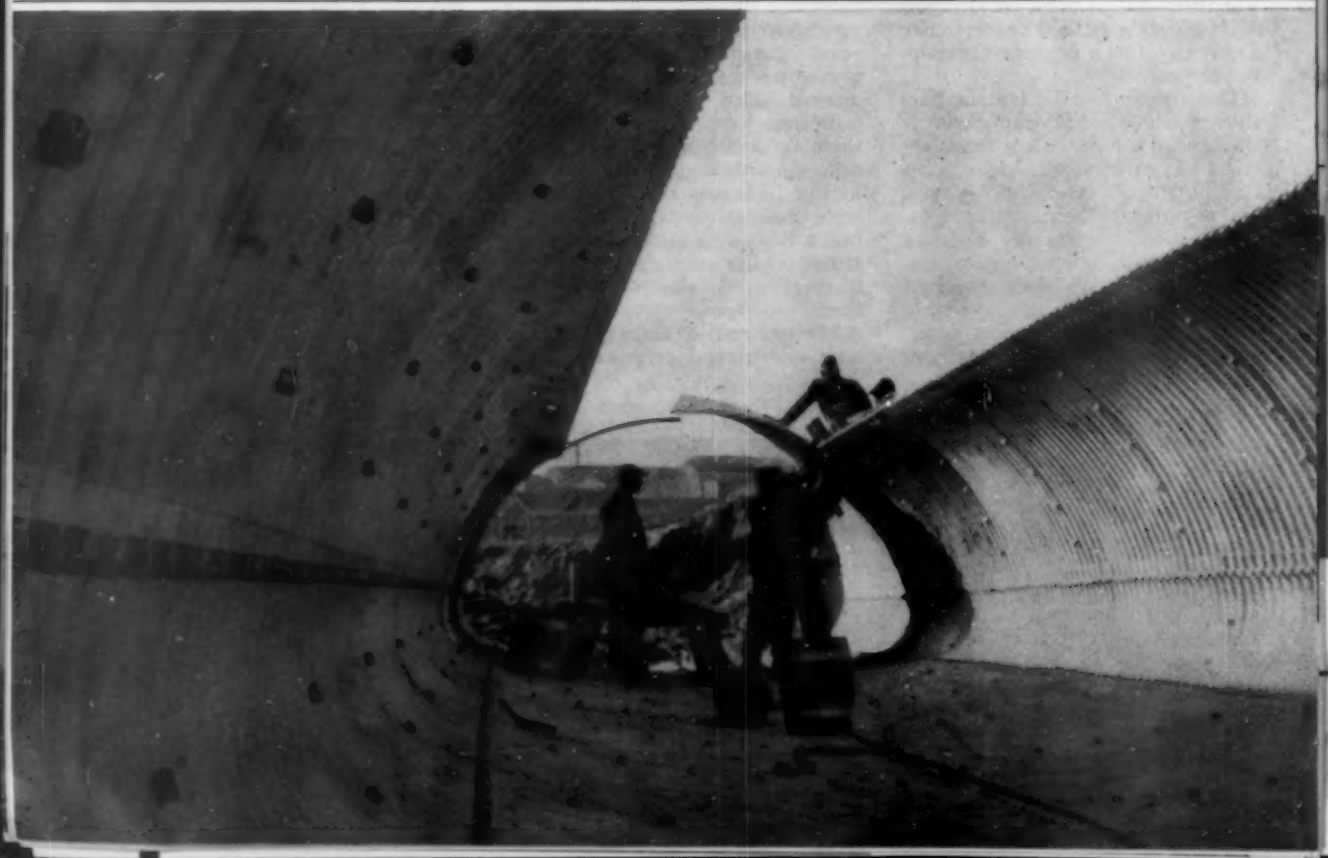
Maintenance of California highways is a big job requiring extensive facilities in many locations. State highway maintenance is divided into eleven districts. District IV with headquarters in San Francisco includes the nine Bay Area counties (see map). Here there are 1340 miles of highway to maintain, including the Bayshore Freeway with an average traffic load of 45,000 cars a day in each direction. Maintenance in this district alone is an investment of $4,000,000 annually with employment of about 420 men. Rainfall over the district varies from 12 to 100 inches per year, which great extreme represents a range of problems.

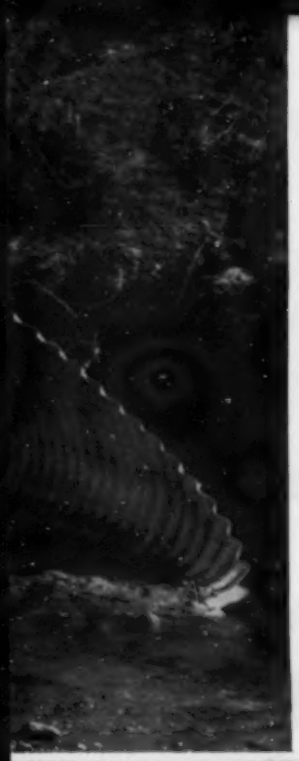
Assistant State highway engineer B. W. Booker is head of District IV. L. A. Weymouth is district engineer in charge of operations. State highway engineer G. T. McCoy is chief of the Division of Highways. The author is in charge of maintenance for District IV.

● **Steel buildings here house oil and grease storage, warehouse and shop.**

KEEP OUR ROADS ON THE GO

American Bridge helps you build more road for the money!





These Structures were furnished to Prince Georges County, Maryland—John H. Marburger, Jr., Administrator of Public Works—by Lane-Penncarva, Inc., Bealeton, Virginia.

Twin Beds for Winkledoodle

. . . or a quick, low-cost way to remove a roadblock

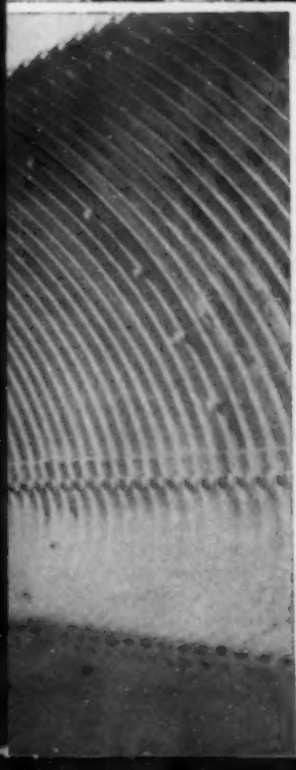
Winkledoodle is a quiet little creek which runs through a real estate development in the Maryland suburbs of Washington.

But sometimes even an innocent-looking stream like Winkledoodle becomes a headache when it blocks progress by dead-ending a street which ought not to be dead-ended. Solving such a problem is less difficult than you might think, as you can see from the experience of the Department of Public Works of Prince Georges County, Maryland.

Serving as giant twin-covered beds for Winkledoodle, long pipe-arch drainage structures shown here were made of USS AmBridge Sectional Plate. They each have a 12′6″ span, a 7′11″ rise, and are 112′ long. Each was erected in the bed of the temporarily diverted stream in just *five working days* by a five-man crew, plus crane.

Job Superintendent says: "They went together easier than any in my experience."

The dimensional accuracy of prefabricated USS AmBridge Sectional Plate Pipe, Pipe-Arches and Arches assures precision fit in the field. In fact, Arthur Richards, Bridge Superintendent, enthusiastically says that the Winkledoodle drainage structures went together easier than any in his experience. He was also impressed with the uniform curvature of the interchangeable plates.



No forms needed . . . no breakage

USS AmBridge Sectional Plate Pipe, Pipe-Arches and Arches eliminate the need for forms. And, being made of steel, there is no breakage. They are permanent. And they can be extended whenever the road is widened. Fabricated to meet all federal and state specifications, they are available in a complete range of standard sizes to satisfy the design requirements for area of waterway openings.

For a free copy of our 28-page AmBridge Sectional Plate Catalog, write direct to our Pittsburgh Office. For information on smaller drainage structures made from USS Galvanized Corrugated Culvert Sheets, please send your inquiry to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

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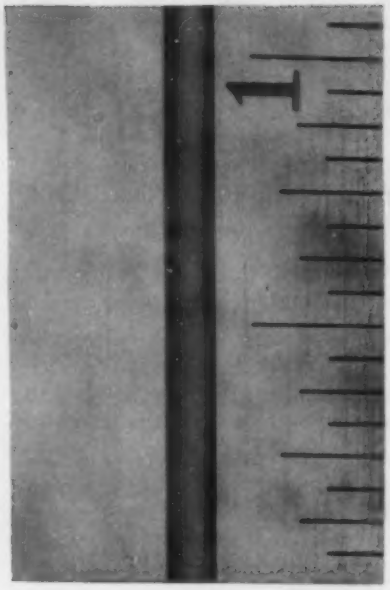
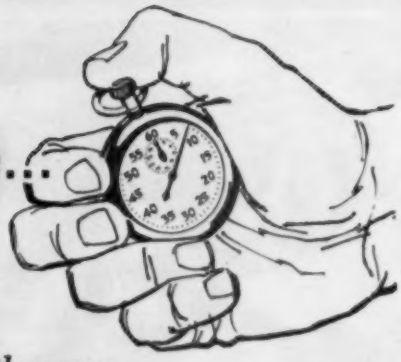


Measure the build-up height...

Clock the deposition rate...



Check all the welding features of the new

STOODY IRON POWDER BUILD-UP ELECTRODE!

Here's a better answer to today's build-up requirements on parts of carbon and low alloy steels. Stoody Iron Powder Build-Up makes tough, rigid deposits of high compressive strength, insuring ample support for hard-facing overlays. Deposits are forgeable, resistant to cold flow and deformation, won't spall, work-harden or crack. Deposits are also machineable with preheat, will not exceed 45 Rc in hardness even when severely quenched.

Unlike most build-up materials, ***Stoody Iron Powder Build-Up does not depend upon carbon to develop hardness!*** Its high alloy content produces a more uniform Rockwell hardness despite wide variations in base metal analysis.

Here's a better, more dependable, general purpose build-up electrode that puts down more metal in a single pass, welds with less spatter and lays down more pounds per hour at a lower cost per pound! Order Stoody Iron Powder Build-Up from your Stoody Dealer today. Check the Yellow Pages of your phone book or write direct.

Literature available

STOODY COMPANY

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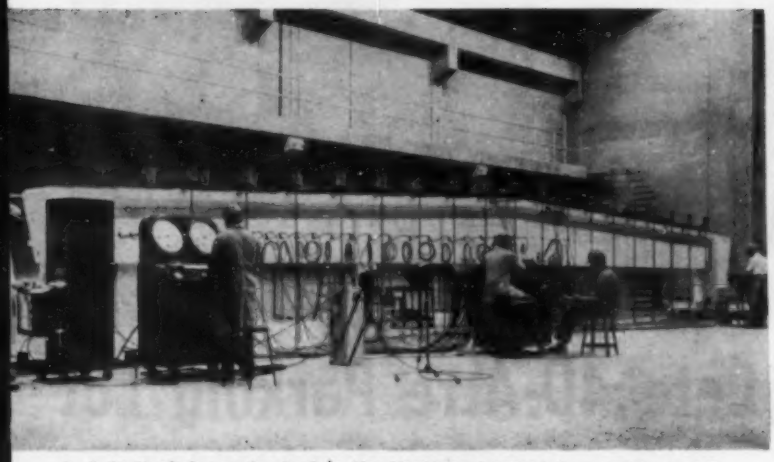
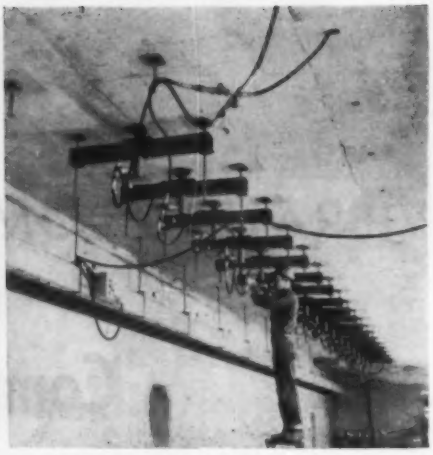


● A 60-ft girder under test in the Portland Cement Association's new structural laboratory. This beam was finally broken under a total load of 360,000 lb.



● Underside of the first floor slab during testing of the 60-ft. girder. These compact hydraulic jacks can exert forces of up to 100,000 lb. through any of 690 holes in the floor.

New Structural Laboratory for Concrete Research

Portland Cement Association's new structural laboratory designed for the testing of concrete structural units contains no testing machines; the three-story building is a giant testing machine in itself, capable of being used to exert test forces greater than 10 million pounds.

The building, part of the association's expanded research and development facilities at Skokie, Ill., will be followed by a second new laboratory, a fire research center, to be placed in operation early in 1959.

The structural laboratory is said to be unique primarily because of its testing floor. The top surface of the 56 x 120 ft. floor is 24 in. thick and is joined to an 18 in. thick basement floor by a series of 8½ ft. high walls. In cross section, it resembles a large hollow box-girder bridge. Actually, the floor is built much stronger than an ordinary bridge because it acts as a test frame for all the forces applied to specimens in the laboratory.

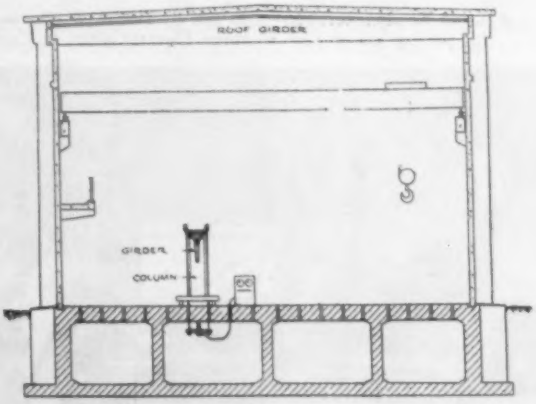
The top surface of the floor is pierced by holes every three feet. To make most tests, steel rods are attached to the test beam or girder and extended downward through the holes to connect with hydraulic jacks located in the basement. These jacks pull down on the rods, exerting enormous loads on the test structures above.

This design gives the laboratory an almost limitless flexibility. Any structural element from a short girder to a full-size floor slab or roof shell can be loaded to destruction. For example, a slab the size of the entire testing floor could be subjected to several thousand pounds per square foot over its entire area.

The building housing the test floor is 56 x 176 ft. in plan. A 22 ft. long bay at one end contains three stories of offices or shops. The rest of the building is one large room, 40 ft. high, with a balcony to accommodate visitors along one side at the second story level.

The entire building above the first floor was assembled from precast concrete elements. The structural elements were designed according to the ultimate strength design method, and utilize high-strength alloy steel reinforcing and 5,000 psi concrete.

The testing area inside the building, air conditioned to 70 deg. F. and 50 percent humidity, is served by a 20-ton crane. Casting of the larger test specimens is done on the test floor. Facilities for producing concrete, casting smaller specimens and many other technical services are available in the main PCA laboratory buildings nearby.



● The test floor is designed by bridge design methods to act as a tremendously strong girder.

Winter Contracting Series

VIBRATING COMPACTOR HELPED

Complete 40-Acre Parking Lot

Large tonnage of stone for 8 in. choked macadam base laid during a season when such paving work was formerly shut down "as matter of course," until following spring.

How a relatively new tool of the roadbuilder helped expedite late-season, wet-weather work, was demonstrated on a large parking lot job at Columbus, Ohio. The experience in paving this lot, which was completed in December of 1957, is of special interest as another cold, wet season approaches.

The job was that of compacting stone base for a 40-acre parking lot for the Western Electric Company's new Columbus plant. The lot had to be finished so that the plant could be opened on schedule right after the first of the year—considered an impossible task with conventional compactor equipment.

The new machine in question, called the Roadpacker, was developed by the Lima (Ohio) Works of the Baldwin-Lima-Hamilton Corporation. Although the machine was being used, in this instance, to build a parking lot, the contractor —A. W. Burns & Sons Construction Company—was using the machine to solve a problem that faces nearly every paving contractor in the country, whether he is engaged in paving a road, a street or a parking area.

Briefly the problem was to get a solid stone base keyed in place, with screenings to fill the voids between stones, and provide a finished surface ready to receive black-top and to do this on an accelerated schedule during wet, freezing weather.

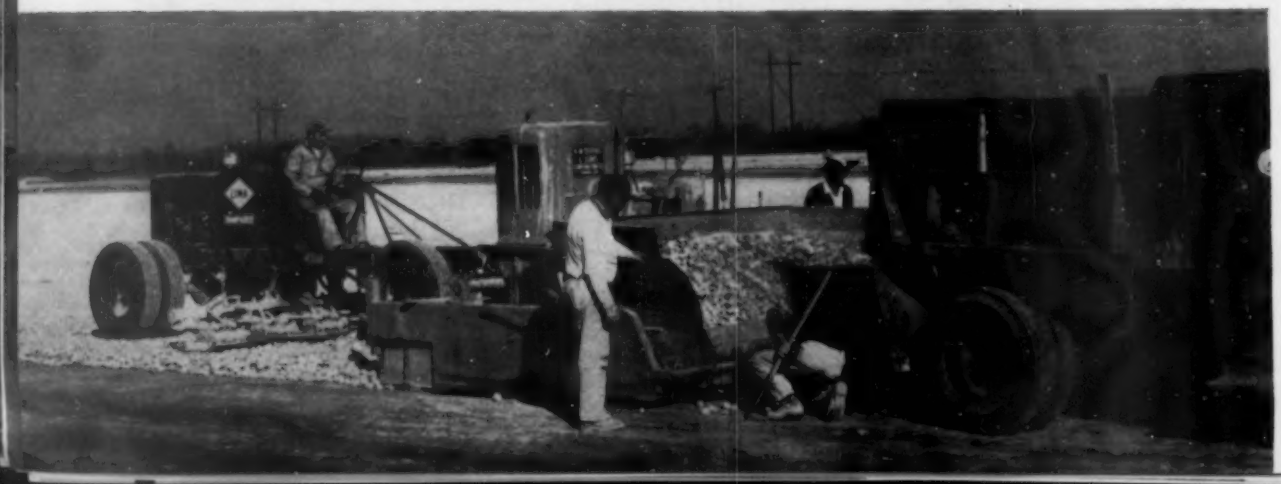
It is perhaps unfortunate that the conditions under which the Western Electric parking lot had to be built are typical of those encountered on most parking lot construction jobs. Most building and highway construction work is scheduled so that it will be completed before wet, freezing weather sets in. Usually, this means that all of the work, except the parking lot, is done before the weather turns bad.

Furthermore, parking lots cannot be done while building construction is going on because heavy equipment and materials must be continually brought to the site, and these would break up or severely damage any type of pavement regularly used for parking areas. However, once a building or highway terminus has been completed, parking areas are needed immediately.

The parking lot job as done by A. W. Burns & Sons offers encouragement to many contractors. It shows that more work can be done on good days in the bad weather season, the compaction job can often be done faster at lower cost and shows that there is a large and growing market for paving work on parking lots.

In downtown Columbus, to cite

● **Lima Roadpacker, shown in use by the A. W. Burns & Sons Construction Co., Columbus, Ohio, on parking lot paving job at new Western Electric plant in Columbus.**



● Curb-side compaction made easy by outer shoes which extend beyond width of machine. Floating action of shoes prevented damage to curb or vibrator. This unit eliminated the need for hand tamping close to the curb.

● The machine kept pace with fleet of 60 trucks hauling 3,000 tons of crushed stone per day—and helped beat the threatened winter shut-down.

Despite Wet November Weather

● Forty-acre job required 94,000 tons of stone placed in 8-in. compacted layer. This view shows one of the two lots built at Western Electric's new plant during November-December of 1957.

just one example, not many miles from where the Western Electric lot was built, a special group was appointed to study and deal with the parking problem. Called the Off-Streets Parking Commission, the group recently sponsored a professional survey that shows the city has 12,000 parking spaces downtown, needs 2,000 more.

While civic officials are moving to solve the central city parking problem, a similar problem faces industry. As more workers drive to work, the need increases for adequate parking around industrial plants.

The Burns' parking lot job, which was a subcontract under the Turner Construction Company, couldn't begin until November 1. As Burns expected, cold, wet weather set in as soon as the job was started. When a few dry days did come along, the pressure was on the contractor to do everything at once: set the grade, lay the stone and get the base keyed and choked with screenings before more rain or snow came along.

Working behind two Jaeger stone spreaders, the roadpacker tightly keyed the stone by vibratory compaction in lanes 13 ft. wide. Trucks were used to feed 2½-in. max. limestone to the stone spreaders at a rate of 3,000 tons a day. An average of 60 trucks kept the material coming on a 12-mile haul along a route through downtown Columbus, in an almost continuous stream. Running screenings into the voids was an almost continual operation carried out simultaneously with the stone spreading.

The packer's capacity of consolidating 400 to 500 tons per hour for this particular kind of material, was more than a match for the amount of stone that the fleet could keep coming. The ability of the machine to compact when moving either forward or backward meant that no time was lost in backing or turning between passes. According to Burns, the capacity of the machine surpassed three heavy rollers. The high speed and maneuverability permitted the machine to scurry about the job and to do touch up work and still keep the main compaction job going.

With bad weather anticipated daily, Mervin Day, Burns' general manager and executive vice-president, had the final grade prepared only a short distance ahead of the stone spreaders. He did this because wet and frozen subgrade is, of course, unsuitable for receiving stone. When the opportunity was created, by two or three good working days in a row, only half-depth of the 8-in. compacted course was spread over the subgrade. This allowed the contractor to spread a second course on freezing days.

A concrete curb encircled the entire area to be paved and, here, the packer's ability to compact stone right up to the curb meant that the job had a finished look from the start. In work close to curbs, the Lima's vibrating shoes were prevented from damaging the curbs by the flexibility of the rubber-mounted vibrators.

Winter servicing of the machine, needed as the weather became

(Continued on page 101)

Earthmoving's first self-propelled scraper . . . with steel wheels, 5 telescoping buckets, and 7 electric motors. This 1923 model was positive-dumping, moved 6 yd at a time, and traveled at about 1 mph.

In 1932, the first rubber-tired scraper. This model was equipped with rubber tires for better production in sand . . . worked so well it opened a new era of speed and mobility in the industry.

Your scrapers are as OBSOLETE as these

An "all time great" in earthmoving: the Super C. World War II vintage, but hundreds are still in use. Yours can do one more big job for you: they can serve as trade-ins on new, big-production Fullpaks.

An old drawn scraper, another favorite among dirtmovers. But compare it to the self-propelled "D", that can be driven job-to-job, and do a dozen earthmoving jobs fast, economically.

EQUIPMENT doesn't have to be *worn out* to be obsolete. A rig in *perfect* condition can be as out-of-date as the four antiques shown directly above. That's because the main difference between equipment of yesterday and today is *production-ability:* being able to move *more* dirt, *faster,* at *less* cost.

A few years ago, almost any production-pace was profitable. Bid prices were about what they are now, and operating costs were much less. A slow-moving "crawler-and-pan" handled most jobs . . . and a then "modern" machine like the Super C Tournapull® was a *real* money-maker. But that was years ago!

Since then, all your costs have skyrocketed . . . but bid prices haven't. Result: there's much less net profit *per yard moved.* To keep profits *up,* nowadays, you've got to move *more* yards per rig . . . and to do so, you need all you can get in both speed and capacity.

Trade up to profit!

That's why it will pay you to retire old veterans in your equipment spread. Though they may be "written off" your books, they may actually cost you more . . . *in production you need but don't get* . . . than it would cost you to own and operate new tools you can now "trade up to." Today's bigger, more powerful, high speed machines let you finish jobs earlier and make more profit. They also protect you with a wider margin of production capacity against delays and extra costs due to abnormally bad weather and other hidden hazards of dirtmoving.

"Cheap" yards not always cheap!

When you're working a rig that's "depreciated to zero" on your books, your ownership-operating costs for that machine are less, of course, than they'd be with new equipment. But that doesn't mean your earnings . . . or profits . . . are better!

Time-weight-and-cost tests of Super C's against C Fullpaks® prove that the extra yards you move with Fullpaks more than make up for this lower operating-ownership cost. Here's what cold mathematics can prove on a given set of job conditions:

1) The Super C can move 105 yd an hour, with operating costs of $8.40 per hour . . . or 8¢ a yard. If the bid price is, say, 25¢ a yard, gross earnings per hour will be $26.25. Subtracting operating costs (with zero ownership cost) means the unit produces earnings of $17.85 an hour.

2) On the same job, a C Fullpak can move 140 yd an hour. Combined ownership and operating costs are $11.92 . . . $3.52 more than those of the Super C. Per yard cost, at 8.5¢, is 5 tenths of a cent higher. But, at the low 25¢ a yard, the Fullpak still earns $35.00 "gross" per hour, with $23.08 "net" . . . $5.23 more than the Super C. Working 1,500-hr seasons? If so, your bonus, at this rate, would be $7,845 per Fullpak!

Combine of Schultz, Lindsay, Tennefos moved as much as 75,000 yd a day on relocation of US 10 in North Dakota. Scrapers, mostly Fullpaks, including 12 "C's", 8 "B's", often loaded in just 22 seconds!

"Power-transfer differential saved the day," reports Contractor Bob Walker, Franktown, Colo. Of 3 makes of scrapers on recent "mud job", only 'Pulls could climb slippery banks on haul-route without pusher help.

if they can't produce like this!

20 pay-yards of 3,000-lb dirt in 47 seconds was average for Hammersley Const. Co.'s B Fullpaks moving this 100' hill from path of highways 57-32 in Wisconsin. Firm also used "C's" for cutting and ditching.

"Finish a job faster, at less cost, than any other earthmover," says Wm. S. Howard, Rockford, of B and C Fullpaks he used on wet, muddy section of Illinois Toll Road. Of "B" he says: "THERE is a production scraper!"

LET us show you weighed-load production records on LeTourneau-Westinghouse Tournapulls with Fullpak scrapers. In their size ranges, the 18-yd "C" and 28-yd "B" move more pay dirt per load, more payloads per hour. Here's how they do it:

Fullpak bowl is lower . . . wider

Proven faster-loading on jobs around the world, Fullpak scraper bowls are *low:* dirt doesn't have to be lifted as high, nor moved through already packed load. Bowls are *wide:* to provide the biggest possible doorway for dirt. Inside the bowl, earth flows easily, freely, with uniform pressure in all directions. You get fewer voids, a uniform pack, a higher heap, full corners, all in less time per load.

'Pulls* work longer, steadier . . . with fewer, lower maintenance bills. Durability features include: all-welded box beams of heat-treated steel; anti-friction bearings for all high-speed shafts; gearing completely enclosed in oil; and earthmoving's simplest, easiest-to-maintain power system: "electrics."

Electric controls boost production

Instant electric response is another one of the reasons that these modern Tournapulls boost production. *In a split-second,* electric motors reach full speed, to operate apron, tailgate, bowl-hoist, and steer. "Push-button" operators learn faster, work faster.

Another L-W "exclusive" that boosts yardage is the patented power-transfer differential. When one 'Pull drive wheel starts to spin in soft going, its torque power is *automatically* and *immediately* transferred to the wheel on better footing. This differential, plus Tournapull's 90° kingpin electric steer (for "duck-walking") will *keep you moving* in *any* dirtmoving weather.

See for yourself . . .

Check our claims. Ask your LeTourneau-Westinghouse Distributor to show you a working demonstration of the 'Pull of your size need. Compare what you see in that demonstration against *any* other scraper on the market. When you're ready to "talk turkey" you will find you'll get a fair deal on those Super C's or other obsolete rigs that are no longer profit-makers on today's big yardage dirt production.

*Trademark CP-1966-DC-2

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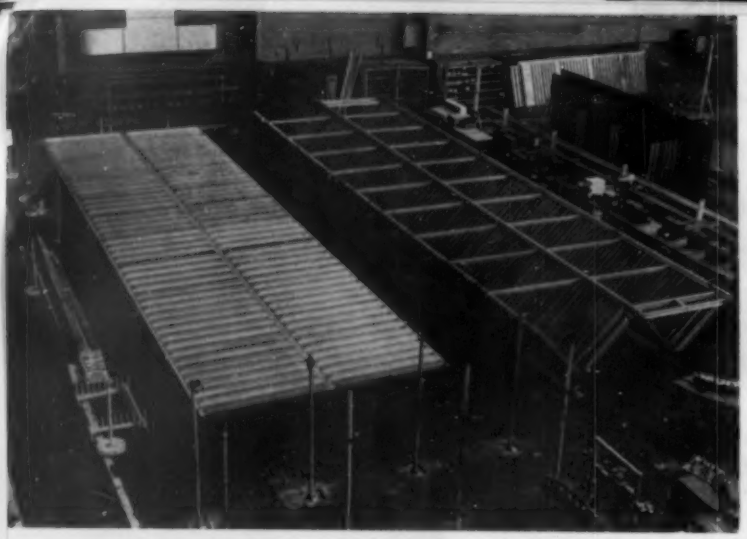
LETOURNEAU-WESTINGHOUSE COMPANY
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit

Aluminum Bridge Designed to Aircraft Principles



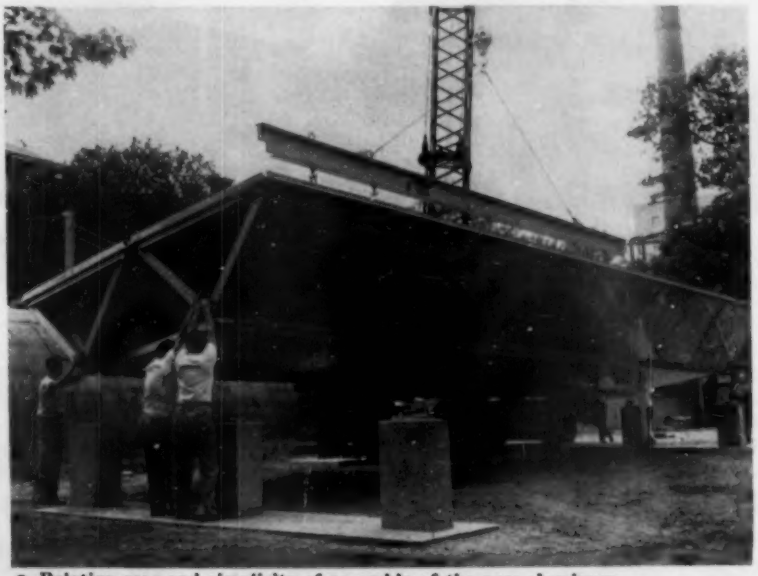
● **Component elements of the bridge, ready for "mating", illustrating the mass-production methods that can be employed. At left is the bottom plate; at right is the main beam sub-assembly. Over 90 percent of the fabrication and assembly can be accomplished "in plant."**

A NEW TYPE aluminum bridge, employing proven aircraft design principles and said to be more economical than conventional spans of other materials, was recently unveiled at Bethlehem, Pa. Demonstration of the test bridge, designed and built by Fairchild Engine and Airplane Corporation, was held on the Lehigh University campus.

Co-sponsors of the test project are Fairchild, the Bureau of Public Roads (U. S. Department of Commerce); Aluminum Company of America; Kaiser Aluminum and Chemical Sales, Inc.; Metals Division, Olin Mathieson Chemical Corp.; and Reynolds Metals Co. Lehigh's Department of Civil Engineering was chosen as an independent agency to conduct the tests. Prof. William J. Eney, director of Fritz Engineering Laboratory at Lehigh, supervised the 11-week test sequence.

Basic fabrication of the test bridge is of thin-gauge stressed sheet aluminum alloy 6061-T6. It is 24 ft. wide and 50 ft. long, supporting a two-lane conventional concrete roadway with a design vehicular load limit of 15 tons per lane. During the demonstration, loads exceeding 175 percent of the design limit were placed on the span.

This bridge design is considered at its best, price-wise, when spans of 80 ft. or longer are required in sufficient quantity to realize the economies of large-scale production. The grade-separation phase of the Interstate program is a market outlet the designers have in mind. The new type span is said to be competitive in initial cost with conventional structures. Important long-range savings also cited because aluminum doesn't require painting.



● **Relative ease and simplicity of assembly of the new aluminum bridge is demonstrated as these workmen guide a section being lowered onto concrete piers at the test site. Assembly of the bridge structure (less roadway and preparation of site) was accomplished in less than two days.**

● **Only two trucks were required to move the prototype bridge from Hagerstown, Md., to the test site, demonstrating the ease of transportation of the new aircraft designed span.**

(Continued from page 96)
colder, was done by driving it 10 miles under its own power after hours to the Columbus Equipment Company, the local distributor. Next day the machine was back, ready for the day's work.

The specifications drawn up by Western Electric were similar to the standard specifications of the state of Ohio for stone macadam pavement. The 8-in. base course stone met the following gradation:

Sieve (Square Mesh)	Percentage Passing by Weight
2½-in.	90-100
1½-in.	25-60
¾-in.	0-10

Screenings were graded as follows:

Sieve (Square Mesh)	Percentage Passing by Weight
⅜-in.	100
No. 4	85-100
No. 100	10-30

The finished macadam base received a bituminous prime coat, in accordance with Ohio's Standard Specifications, Item T-30. A 2½-in. bituminous concrete surface was then applied in two layers.

Third Edition of New Sling Handbook Now Available

A 40-page reference book covering more than 80 subjects on Tuffy slings and fittings is now offered by the Union Wire Rope Corporation of Kansas City, Mo. Demand for the preceding editions called for printing of more than 125,000 copies.

The new edition has new reference information condensed into handy chart form on sling types, dimensions and rated loads. The section on Tuffy Sling fittings has been expanded to cover many fittings not previously shown, with reference charts on sizes, rated loads, etc.

Union Wire Rope Corp., subsidiary of Armco Steel Corp., is offering the handbook to purchasing departments, safety engineers, plant engineers and other personnel using or specifying slings. Copies may be obtained by writing for Form SL-3 Union Wire Rope Corporation, 2100 Manchester Ave., Kansas City 26, Mo.

Make Sure of Your Welding Ground

Arc welders are familiar signs of maintenance work in progress. But this important tool can become a damaging force without a good ground. Here's an explanation of what can happen.

DURING arc welding a heavy electric current passes from the welding generator through cables to the metal being welded. It then jumps across a gap, melts the metal electrode and returns to the generator. The path of the electric current traveling *from* the ground clamp through a tractor, engine or other piece of equipment to the point where the arc occurs, is of the greatest importance.

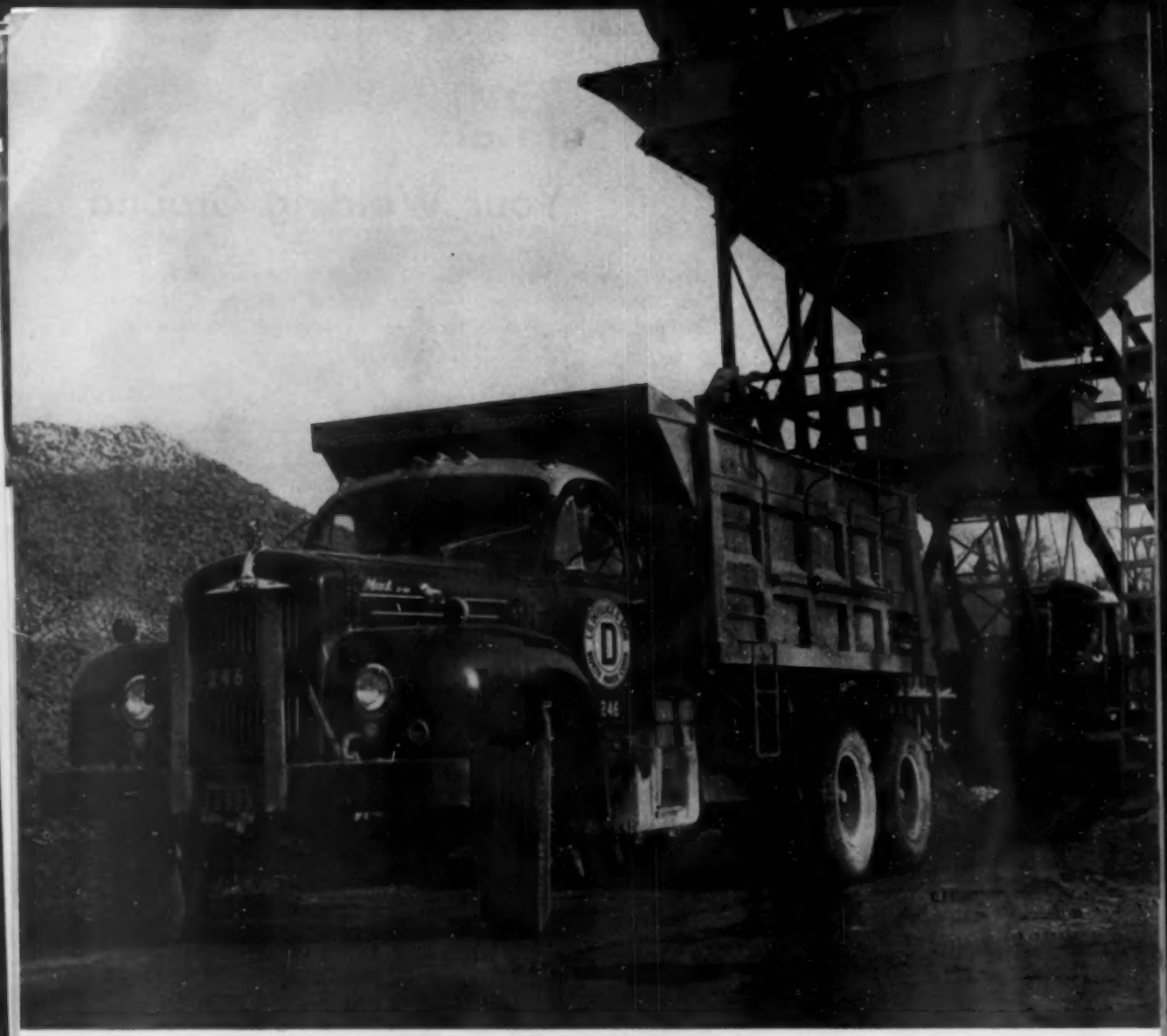
According to the Service Department of Caterpillar Tractor Co., an arc is likely to occur wherever a gap interrupts the flow of current. The heavy welding current may also break up and take numerous paths through a machine on which the welding is being performed. Should the current encounter an air gap across a bearing in an engine, it is possible for welding to take place right there. Although fusion of the two pieces may not take place, weld blotches on a bearing or gear can cause an early failure of the part—simply because the ground connection of the arc welder was not properly placed.

Caterpillar engineers state that failures in transmission and engine bearings and gears were traced to arc welds on those parts. Arcs have been known to occur in the transmission when the welding was being done on the front end of a tractor.

The paths taken by the return current to a welding generator are unpredictable. The only certain thing about an electric current is that it will travel the route of least resistance. For this reason it is best to fasten a ground clamp directly to the piece being welded. If this is impractical, take extra care to clean off rust, paint or oil to give the return current the least chance of going astray.

Give the return current a short, direct path and stray currents won't damage other parts of the machine. Next time arc welding is to be done, make sure of the ground!

● Is the fellow welding a hidden bearing as well as a surface part because of a poor ground?



An efficient batch plant and dependable Mack dumpers—two important factors in the modern paving methods used by L. G. DeFelice & Son of North Haven, Connecticut. Ten Mack dumpers supplied the dry mix for the two dual-drum pavers.

On the Connecticut Turnpike...

job time slashed by efficient

L. G. DeFelice & Son finished their section of the Connecticut Turnpike well ahead of schedule . . . thanks to efficient batch-haul paving. Their record for a 10-hour day was 1566 cubic yards—enough concrete for 4255 linear feet of 10-inch, 12-foot pavement. Their daily average over the five-mile, six-lane stretch was almost as high. The job was done with ten Mack dumpers supplying two dual-drum pavers working tandem, with wire fabric laid on the five-inch pour of the first paver.

Comments Joe DeLucia, project superintendent for DeFelice, "This job kept the Macks hustling. But they never let us down. We figure that our investment in paving equipment and crews is too big to gamble with trucks that can't keep going. On the vital hauling jobs, we rely on Macks."

The medium-sized Mack dumpers used for this important batch hauling were equipped with Mack

Each Mack dumper carried five 1½-yard batches. First batch dumped by opening tail gate. Air-operated batch boards, designed by Equipment Supervisor Felix DiGiusto, speeded dumping of the other four batches. Quickly removable batch boards convert trucks to conventional dumpers with a 10-yard capacity.

batch-haul paving

Quadruplex transmissions, four-wheel drive Mack Balanced Bogies with Power Divider, economical 150-horsepower Magnadyne gasoline engines, and power steering.

To find out how you can do more work at lower cost with fewer trucks, call in your Mack representative. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

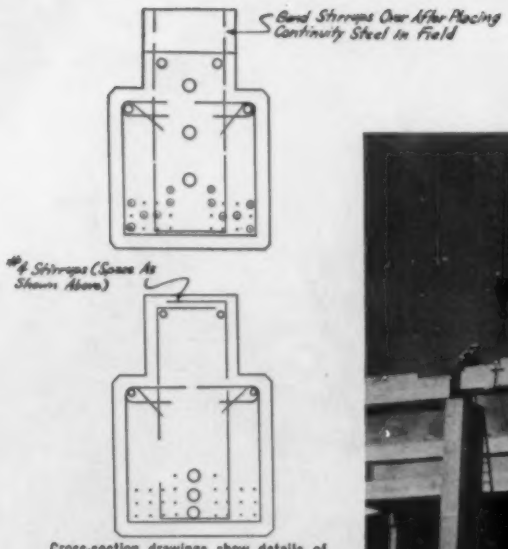
. . . for more details circle 286 on enclosed return postal card

MACK

first name for

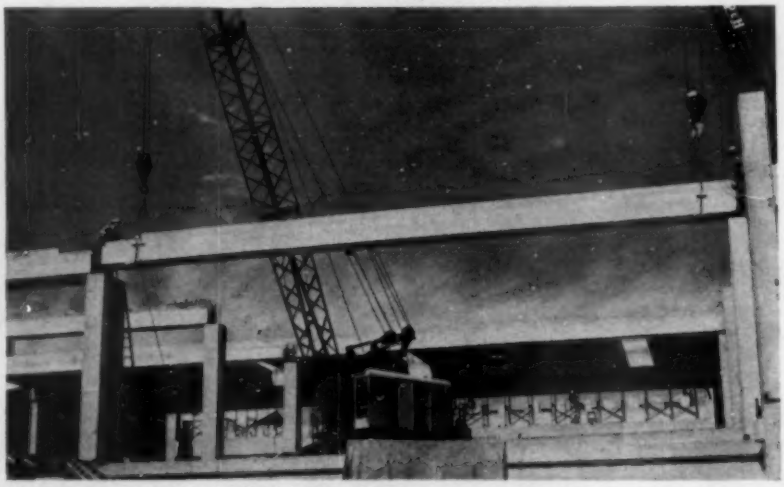
TRUCKS

5785



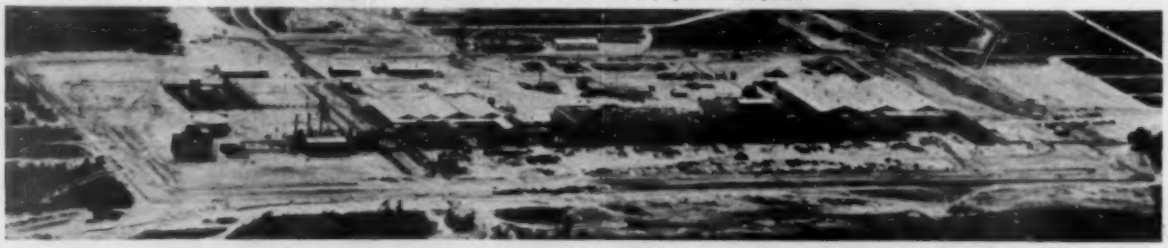
Cross-section drawings show details of typical 59-ft 8-in. inverted tee girder at one end and mid-span. The three Freyssinet tendons, each with 18-0.196 in. dia. wires, were deflected to provide increased strength.

Prestressed concrete consultant: Ross H. Bryan, Consulting Engineer, Nashville, Tennessee.
Prestressed concrete manufacturer: Southern Prestressed Concrete Company, Inc., Pensacola, Florida.
General Contractor and prestressed concrete erector: J. A. Jones Construction Company, Charlotte, N. C.
Architect-Engineers: Lockwood Greene Engineers, Inc., New York, N. Y.



Here, prestressed concrete roof girder is lowered into place.

Aerial view of nearly completed plant. Entire facility covers an area of 1800 acres and will employ some 425 people.



Main manufacturing building of $25,000,000 American Cyanamid plant built of prestressed concrete

American Cyanamid Company's New Creslan* Acrylic Fiber plant near Milton, Florida, is one of the world's most modern fiber production facilities.

The main manufacturing building is constructed of prestressed concrete. At peak production, this plant will turn out 27,000,000 lbs of Creslan fiber annually. The raw material for this synthetic fiber will be supplied by Cyanamid's plant in New Orleans.

Southern Prestressed Concrete Company, Inc., Pensacola, Florida, manufacturers of all prestressed members for the plant, in describing the main manufacturing building, stated: "The column spacing was uniform throughout at 25 x 60 ft; column heights varied over a range of from 13 to 33 ft. Because of the location in a coastal area, the structure was designed for a wind load of 40 psf. The roof deck was designed for uniform dead and live loads, and also for a number of concentrated loads. Special girder designs were used for the larger concentrated loads; each girder being 24 inches wide with heights from 36 to 40 inches. To reduce vertical height, the girders were inverted tee in shape, with the roof members resting on the ledge thus formed. The roof deck members are 14 inches deep by 4-ft wide double tees. Also furnished were floor and roof panels for a corridor of about 1000 ft in length. The entire job required over 2000 precast, prestressed pieces and about 100 miles of Roebling prestressed wire and strand."

This structure is one of the newer and bigger examples of prestressed concrete's ever-growing acceptance throughout the United States. In addition, it bears out Roebling's conviction that prestressed concrete is fast becoming a mode of construction with benefits that can only be considered impressive. Roebling's role in the prestressed field goes back to the introduction of the method in the United States. We invite inquiries of any nature on the subject of prestressed concrete. An inquiry to Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, will bring a prompt reply.

*Creslan, Reg. T. M.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

. . . for more details circle 296 on enclosed return postal card

New Products

Reader Service Numbers on Enclosed Postcard

All-Weather Cab for "Michigan" Construction Equipment

All-Weather Cabs

A full line of all-weather cabs for "Michigan" 1½ to 6-cu. yd. tractor shovels, 162 to 600-hp tractor dozers and 5,700 to 20,000-lb. acpacity tractor loggers is offered by Clark Equipment Co.

The cab protects the operator from wind, dust, rain, snow and cold—yet permits all-around the overhead visibility. The operator has an unobstructed view of the bucket, logging clamps or dozer blade at all times.

Construction Machinery Division, Clark Equipment Co., Pipestone Road, Benton Harbor, Mich.

For more details circle 101 on Enclosed Return Postal Card.

Chevrolet's 1959 Series

Substantially increased fuel economy in the light-duty line, a new optional power train for two heavy-duty series, a wider range of optional equipment, and numerous engine and chassis improvements feature the 1959 Chevrolet truck line. The number of models offered has been expanded to 139, three more than last year, on 22 different wheelbases. Gross vehicle weight ratings range from 4,000 to 36,000 lb. In general, the massive functional styling that proved popular in 1958 models is retained.

Features of the heavy-duty units include: two new optional close-ratio five-speed transmissions, improved power steering, increased durability of rear axles, refinements of the 9000-lb. front axle assembly with full air brakes, and numerous other engine and chassis improvements. A new optional power train for 70 and 80 Series models includes a larger V-8 and heavier clutch transmission, and rear axle. Tandem axle assemblies retain the built-in power divider and auxiliary 3-speed transmission. The closely stepped gear ratios in the new optional 5-speed transmissions help maintain road speed in highway operations. Powermatic transmission also is available. A 230-hp V8 is standard on 90 and 100 Series models.

Chevrolet Motor Division, General Motors Bldg., Detroit 2, Mich.

For more details circle 102 on Enclosed Return Postal Card.

Rubber Improvement

Tests of truck tires made with a substantial portion of "Diene," recent synthetic product of Firestone Tire & Rubber Co., are stated to have revealed the following outstanding characteristics: (1) to a marked degree, "Diene" improved the crack-resistance of the tire; (2) the running temperature of the tire was satisfactory; (3) skid resistance was greatly improved because of the pliability of "Diene" at low temperatures.

Announcement of the new product points out that "Diene" (butadiene base) and "Coral" rubber (isoprene base) may play an important role in the conservation of natural rubber, the supply of which is limited, and can reduce the amount of the tree-grown product necessary in the stockpile for national emergencies. "Coral" rubber is an earlier Firestone development.

The Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron 17, Ohio.

For more details circle 103 on Enclosed Return Postal Card.

The 1958 Chevrolet "Spartan 100" Heavy-Duty Tandem

Your Truck Body Angle?

"Safe Angle Indicator" is the name given to a new safety device designed for installation on any equipment which is built to operate at a variable angle to the ground. It cuts danger of truck upset, avoids dumping of excess material, and in the treatment of icy roads relieves the operator from the need to step out on the running board to determine the angle of elevation of his dump body.

Monroe Standard Inc., Galion, Ohio

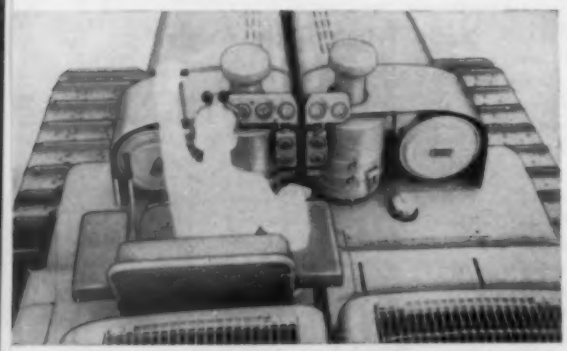
For more details circle 104 on Enclosed Return Postal Card.

(Continued on page 109)

Tremendous power, quick maneuvering and on-the-go power shift cut valuable seconds from cycle times when the TC-12 is used for push-loading scrapers.

As a dozer, this Twin-powered Crawler provides unmatched work-ability because of its ease of handling, smooth push power and brute strength.

For heavy ripping work, you can count on unequalled drawbar pull and plenty of stability to do a really fast and thorough job.



With convenient, simplified controls, the TC-12 has no equal for operating ease—by keeping operator fatigue to a minimum, full shift efficiency can be maintained.

New Series EUCLID

Ever since the TC-12 was introduced, there has been no question about its top performance ability—even on the toughest crawler jobs. Now with over 3 years of field experience on practically every kind of operation, major product improvements make the new TC-12 better than ever.

Powered by two engines, there's a total of 402 net horsepower delivered to the power train through separate Torqmatic Drives for each track. Big 27" shoes and 8 rollers give the TC-12 good balance with or without heavy duty dozer blades and other mounted equipment. Bare weight of the tractor has been increased to 67,000 lbs. as a result of heavier construction and more rugged components throughout.

With independent track drives, there's no dead track drag when turning—maneuverability of the big TC-12 with its full power shift saves seconds on every cycle whether you're push loading scrapers, dozing or pulling big equipment. And with unitized assembly, good design of component location and equipment mountings, this "Euc" crawler provides easy accessibility for service and maintenance.

Have your Euclid dealer give you all the facts on the new TC-12 . . . you'll find it's your best buy by far where big tractor performance is needed.

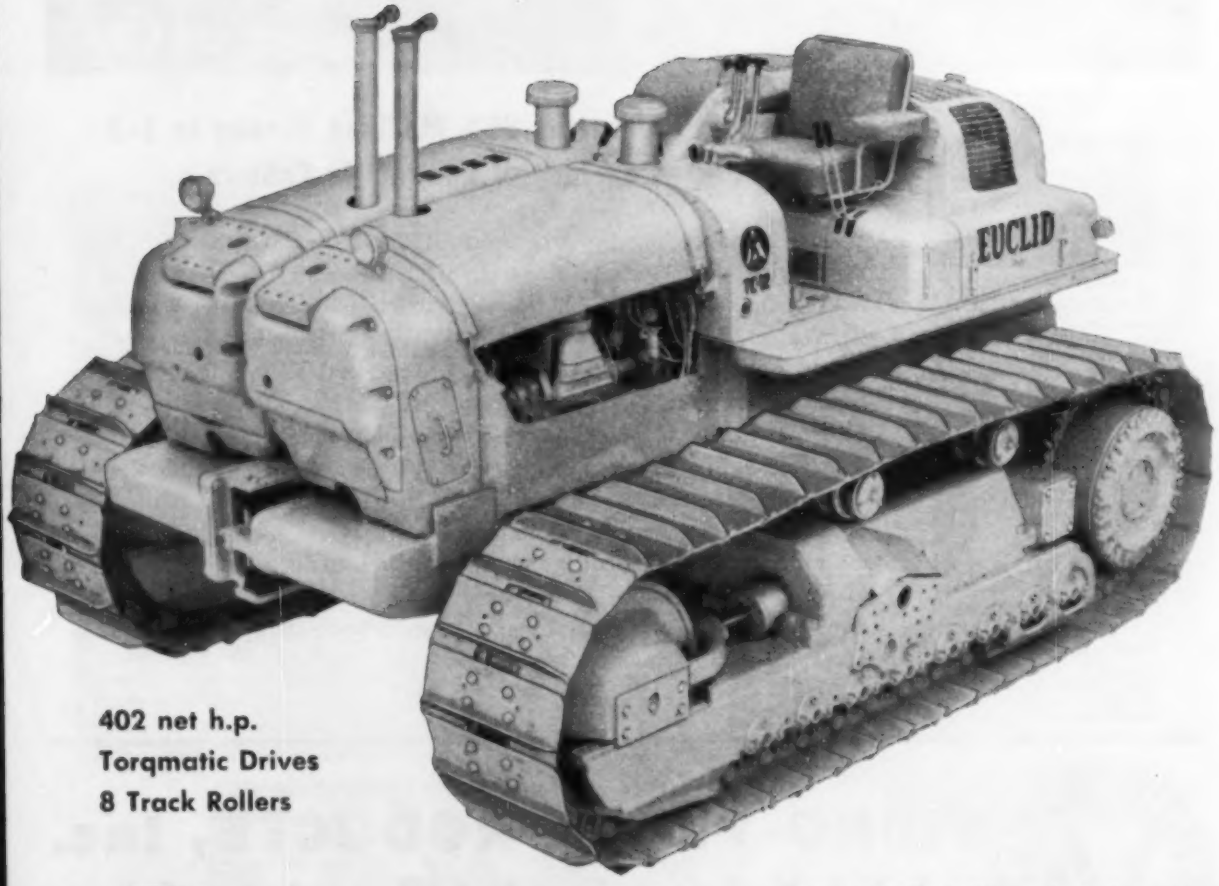
EUCLID DIVISION of GENERAL MOTORS, CLEVELAND 17, OHIO

TC-12 ...now even further ahead of other crawlers

in maneuverability . . . service accessibility . . .

in functional design . . .

and in work-ability



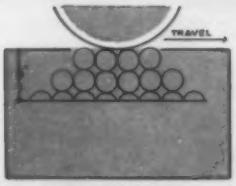
402 net h.p.
Torqmatic Drives
8 Track Rollers

. . . for more details circle 274 on enclosed return postal card

GM GENERAL MOTORS EUCLID

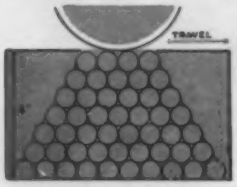
EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



CONVENTIONAL STATIC COMPACTION

Static rollers, relying on weight alone, produce friction forces between soil particles causing bridges to form. Terrapacs break bridges for deep compaction.



TERRAPAC DYNAMIC COMPACTION

Vibratory energy breaks frictional forces binding soil particles together, allows soil to sift down producing uniform densities at greater depths.

A Terrapac Roller Hits 95% Modified Density in 2-3 Passes on Federal Contract in California

When Fresno Paving Co. was awarded the Federal contract for recompacting the slopes and bottom of the Madera irrigation canal, between Madera and Fresno, (for the Bureau of Reclamation) William C. Wehner and Frank Pozar chose the CH-30 as the most efficient and economical compaction tool for the job. . . . 80,000 yards of canal lining had to be ripped to a depth of 9"-12" and recompacted to 95% Modified density. . . . The soil varied, with a large proportion of it clay, with volcanic ash, shale and large rock present. . . . The slopes were 20-23 feet deep and ranged in angle between 1:1 and 2:1. . . . Using a dragline, the 95% density was obtained in 2 or 3 passes. . . . In addition, the roller "buried" the rock and left a smooth, polished surface. . . . Mr. Wehner also said, "The CH-30 saved the job for us." Testimonials are wonderful, but we suggest that you satisfy yourself by asking for a Terrapac CH-30 demonstration today!

Ad 41-54

VIBRO-PLUS VB TERRAPAC

VIBRO-PLUS PRODUCTS, Inc.

STANHOPE, NEW JERSEY

WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES!

. . . for more details circle 310 on enclosed return postal card

New Products

(Continued from page 105)

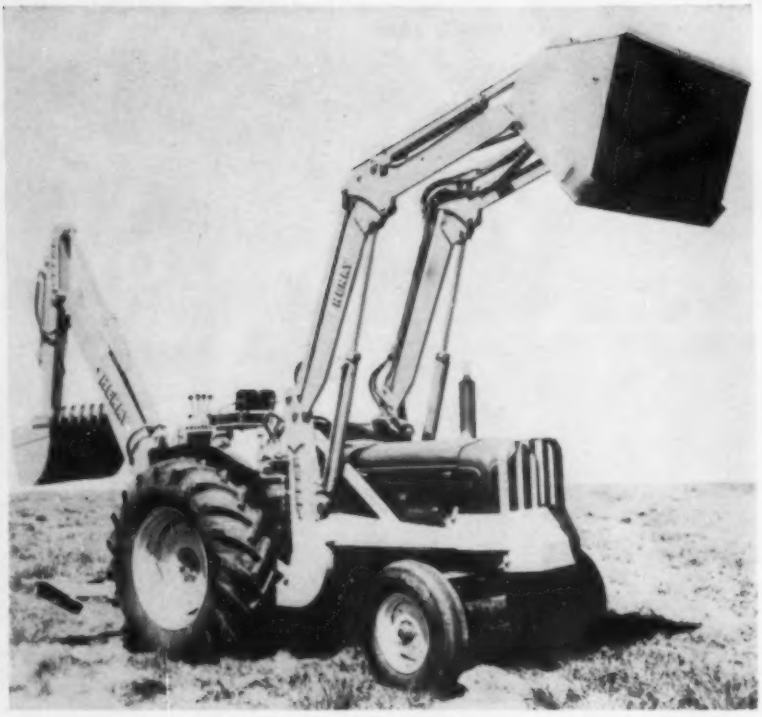
Tractor Shovel

A new tractor shovel, the Henry 900 built specifically for the Fordson Major tractor, has been introduced by Henry Manufacturing Co., Inc. It has a breakaway capacity of 5,000 lb and a lifting capacity of 3,000 lb to a full height of 9 feet, maximum tilt back of the bucket is 25°, while the bucket's maximum dump angle is 50 degrees. With the bucket at 40 degree dump angle at 9 ft., it has a reach of 33 in. Two bucket sizes are available: a 60-in. having a capacity of ¾ yd heaped or ⅝ yd struck and a 66 in. with a capacity of ⅞ yd. heaped or ¾ yd. struck.

Henry Manufacturing Co., Inc., Topeka, Kansas

For more details circle 105 on Enclosed Return Postal Card.

(Continued on page 112)



Henry 900 Tractor Shovel

FOR THE
TOUGH
JOBS
CONTRACTORS PREFER
BMCO

Job: Widening U.S. 81
Location: Bexar County, Texas
Contractor: Killian-House Co.
BMCO was called upon for the extremely tough job of widening U.S. 81, the greatest traffic street in San Antonio, without stopping the flow of traffic.

BMCO
BROWNING MANUFACTURING CO.
111 HUMBLE AVE. • P.O. BOX 2707
WAlnut 3-4331 • SAN ANTONIO, TEXAS

. . . for more details circle 249 on enclosed return poste

Austin-Western 6-wheel grader gives Buffalo contractor 5 years' rugged service... maintenance cost only $300!

"We rely on Austin-Western for rugged, dependable performance. It's one tandem grader that has the guts and power to handle any tough assignment the construction business can throw at it." That's what George Sheperd, general manager of Bruner Asphalt and Construction, Inc., Buffalo, N.Y., has to say about Austin-Western graders.

No downtime

"We just don't have maintenance problems and expensive downtime with our Austin-Western equipment. Aside from routine service requirements, it is hardly ever in the shop. We receive excellent cooperation from the A-W distributor on the rare occasions when we do require parts or service.

"In construction, perhaps more than any other business, time means money. That's why the A-W's ability to tackle even the heaviest of jobs and do them faster is so important to us. Of course, the fact that we can always depend on the A-W to stay on the job and help maintain project schedules is equally important.

Powerful 6-wheel Austin-Western tandem grader prepares bedrock surface for construction of a cloverleaf, part of the giant New York thruway project. Rear wheels are offset to compensate for sidethrust of fully loaded blade.

"A man can do a better job when he likes his machine. A satisfied operator and a top-performance grader make an unbeatable combination. Our operator likes the A-W. He says it is comfortable to operate, and so easy to maneuver that even in reverse he can get right in between 12-ft. forms.

Four main reasons

"All-wheel drive . . . all-wheel steering . . . hydraulic controls . . . torque converter—I'd say those are the four main reasons why we're sold on Austin-Western. They combine to deliver power, traction, maneuverability and precision control!"

Investigate. Learn now why contractors the world over are choosing Austin-Western for the really tough construction jobs. The versatile, hard-working A-W is available in 6-wheel and 4-wheel models with a wide choice of power plants. Torque converter optional. Contact your nearby Austin-Western distributor or write us.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

. . . for more facts, circle 238 on enclosed return postal card

New Products

(Continued from page 109)

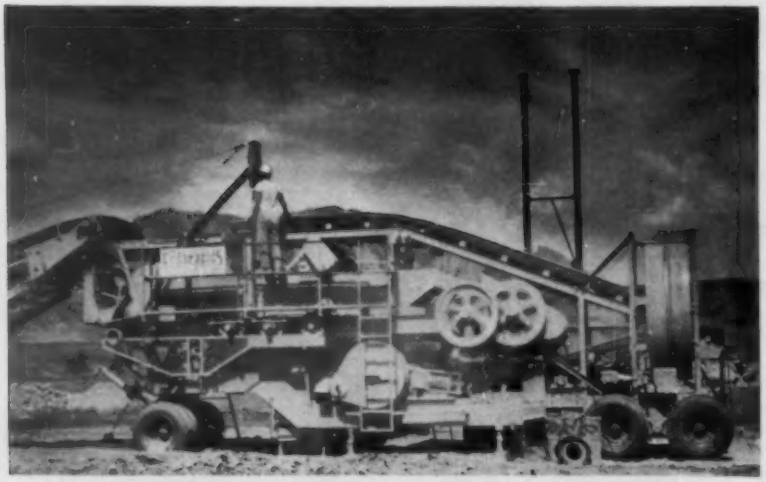
Crushing Plant

A departure from the conventional design of tandem crushing and screening plants is exemplified in the new Cedarapids "Challenger." By using a high speed 12 in. x 36 in. twin jaw crusher for primary crushing the "Challenger" is said to have from 40% to 100% greater primary capacity than plants with the conventional single jaw crusher.

The twin jaw crusher of the "Challenger" combines Cedarapids overhead eccentric design with two movable synchronized jaws operating at high speed to impart a high impact velocity to material in the crushing chamber. Both jaws move inward and downward, forcing the initially crushed material into the lower part of the crushing chamber where it is again reduced. The "Challenger" can be fed from the front to produce 100% crushed or fractured aggregate, or from the rear when a high percentage of crush is not important. Screen decks can be arranged to produce from one to four sizes of aggregate ranging from 2 in. ballast down to ¼ in. minus for fines.

Iowa Manufacturing Co., Cedar Rapids, Iowa.

For more details circle 106 on Enclosed Return Postal Card.



New Cedarapids "Challenger" operating in the Western Rocky Mountains.

Improved Ice Melter

An ice-melting material designated "Ice Rem Super" is announced for large volume use on roads and extended areas. Though possessing special advantages for many applications, it is not intended to replace either

(Continued on page 114)

McCARTHY AUGER DRILLS . . . . . for EVERY PURPOSE

Heavy-Duty Vertical auger drill gives you more profit per job by drilling from 3 to 24 in. diameter holes 400-800 ft. per day.

Trench-type auger drill speeds pipeline work by drilling under roads, RR beds; readily equipped with pipe-pusher.

These two McCarthy Auger Drills speed work and cut costs in a variety of contracting jobs — blast hole, foundation and deep post hole drilling, dewatering, exploration; and underground pipeline installation. Bid lower, work faster and profit more with these two great McCarthy Auger Drills. Contact your nearest representative or write direct for Bulletin M-100 (vertical) and Bulletin M-107 (trench-type).

Manufacturer of Drilling Equipment Since 1901

THE SALEM TOOL CO.

808 S. ELLSWORTH AVE. • SALEM, OHIO, U. S. A.

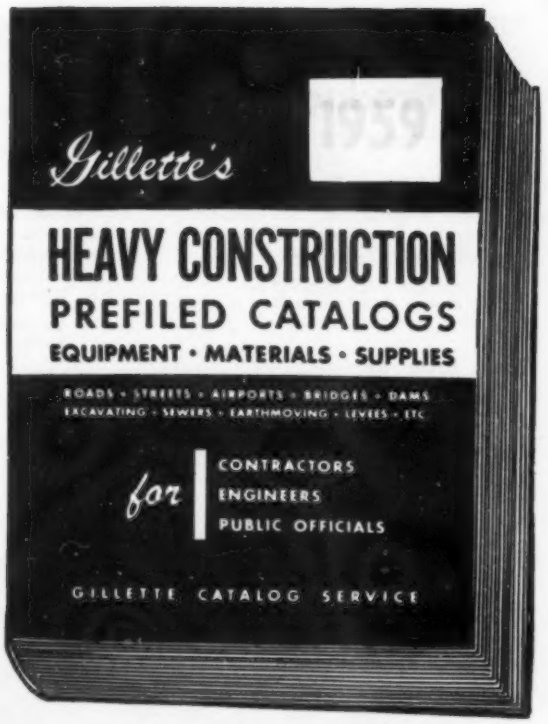
. . . for more details circle 298 on enclosed return postal card

here . . . without a doubt . . . is the most useful buying catalog in your office

. . . and here are some reasons why you should be USING IT DAILY!

- Catalogs are PREFILED — Saving you time and space required to file individual manufacturers' catalogs.
- Saves you the time and inconvenience of writing to manufacturers for catalogs.
- Gives you all the facts needed BEFORE you make a buying decision.
- Manufacturers' names and trade names indexed alphabetically for quick reference to individual catalogs.
- All the buying information is 'boiled down' — designed for your convenience.

After checking the advantages listed above, you can see why this ONE CATALOG offers you so MANY advantages . . . saving you both time and money, not only in the mechanical and physical aspects of a cataloging operation . . . BUT MOST IMPORTANT OF ALL . . . it is available WHEN you NEED it . . . BEFORE you make your buying decisions! The manufacturers represented in this catalog are literally 'meeting' with you in your office — offering you all the information you could possibly need concerning their products. Why not meet them at least half way — and USE THEIR PREFILED INFORMATION!



Here are the manufacturers represented in Gillette's Heavy Construction Prefiled Catalog:

American Steel & Wire
Armco Drainage & Metal Products, Inc.
Austin-Western

Baldwin-Lima-Hamilton Corporation
Barber-Greene Company
Browning Manufacturing Company

Carey Manufacturing Company, The Philip
Chrysler Corporation, Industrial Engine Div.
Clark Industries
Cleaver-Brooks Company
Cleveland Form Grader Co., The
Cleveland Trencher Co., The
Colorado Fuel & Iron Corp., The
Continental Motors Corporation
Cummer & Son Co., The F. D.

Detroit Diesel Engine Div.

Erie Strayer Company

Flexible Road Joint Co., The

Gar-Bro Manufacturing Co.
General Motors Corp.
Gledhill Road Machinery Company, The

Harnischfeger Corporation
Heltzel Steel Form & Iron Co., The
Huber-Warco Company, The

Jackson Vibrators, Inc.
Joy Manufacturing Company

Miller-Tilt-Top Trailer Company
Minneapolis-Moline Company

Naugatuck Chemical Div.

Onan & Sons, Inc., D. W.
Owen Bucket Company, The

Phoenix Products Company
Pioneer Engineering
Pressite-Keystone Company

Republic Steel Corporation
Rogers Brothers Corporation
Rogers Dozer Rippers

Seaman-Andwall Corporation
Seaman-Gunnison Corporation
Servicised Products Corp.
Shownee Mfg. Co., Inc.
Stow Manufacturing Co.
Symons Clamp & Manufacturing Co.

Timken Roller Bearing Co., The
Toncan Culvert Manufacturers Association

United States Rubber Company
United States Steel Corp.
Universal Form Clamp Company

Waukesha Motor Company
Williams Form Engineering Corp.

New Products

(Continued from page 112)

"Ice Rem Regular" or "Ice Rem-CF."
Speco, Incorporated, 7308 Associate Ave., Cleveland 9, Ohio.

For more details circle 107 on Enclosed Return Postal Card.

New Line of International Tractors

New International 460 Utility with International-Pippin Backhoe

International Harvester Company has announced a new line of commercial wheel tractors in six power sizes ranging from 12.8 estimated horsepower to 72 ehp. Features include 6-cyl. engines on the big tractors; new styling; increased power in most models; selection of gasoline, LP gas, distillate, or diesel engines. Shown here is the International Model 460 utility tractor with new International-Pippin backhoe.

International Harvester Company, 180 N. Michigan Ave., Chicago 1, Ill.

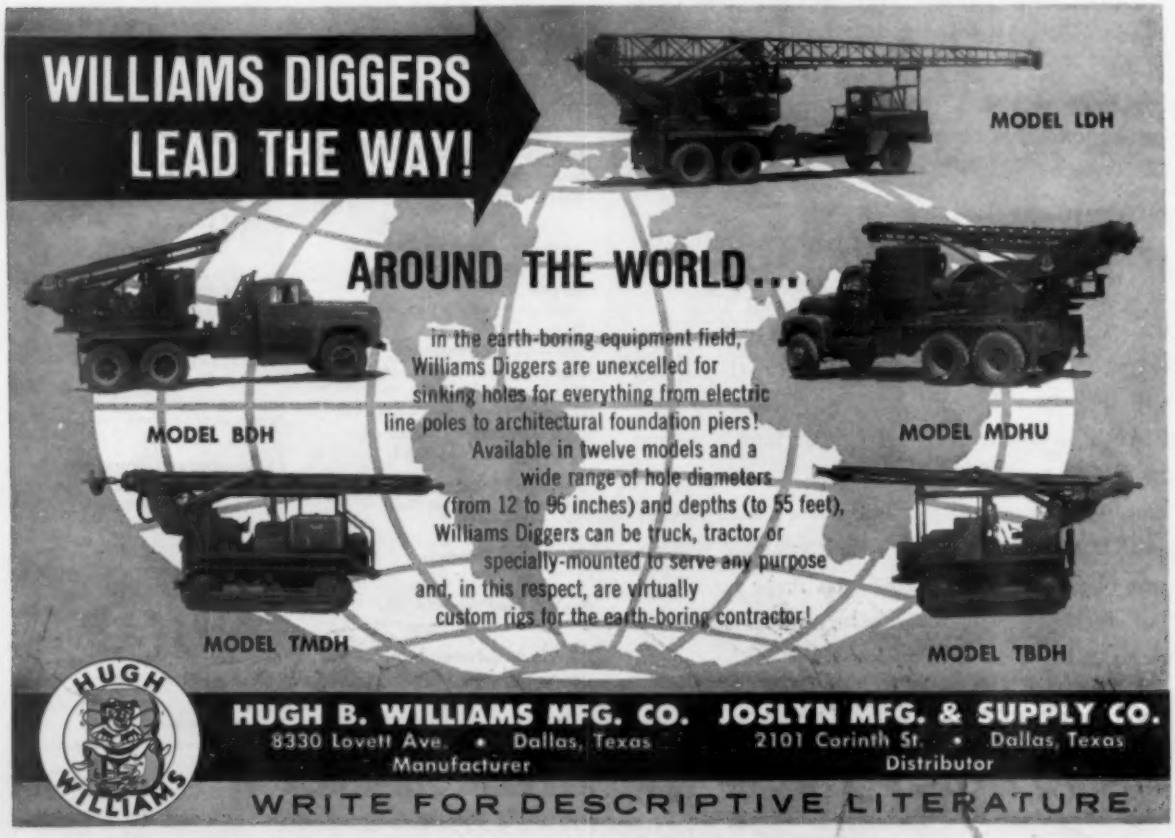
For more details circle 108 on Enclosed Return Postal Card.

60 Yard Scrapers Are Here

R. G. Le Tourneau, Inc., has reentered the earth-moving equipment business with a self-powered scraper of 50 to 60 cu. yd. capacity. Though this is the world's largest to date, Le Tourneau, is now planning a unit approximately twice as large.

The new unit, which is in the 70-ton work capacity class, was displayed at the American Mining Congress in San Francisco in September, to show its adaptability to large-scale strip mining, in addition to its application in road building, reservoir construction and heavy earth work in general.

Making this type of machine possible is the "electris wheel" system, which includes a dc electric motor geared directly to the inner-rim of every wheel. Also it includes ac motors at other points where power is needed-steering, manipulating the loading and unloading mechanisms, etc. There are no wearing parts in the brake system. "Power proportioning" shifts available horsepower away from any


WILLIAMS DIGGERS LEAD THE WAY!
MODEL LDH
AROUND THE WORLD...
in the earth-boring equipment field, Williams Diggers are unexcelled for sinking holes for everything from electric line poles to architectural foundation piers! Available in twelve models and a wide range of hole diameters (from 12 to 96 inches) and depths (to 55 feet), Williams Diggers can be truck, tractor or specially-mounted to serve any purpose and, in this respect, are virtually custom rigs for the earth-boring contractor!
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wheel which may begin to slip. Power is supplied by a 600-hp. Cummins diesel, coupled to Le Tourneau-built ac and dc generators.

R. G. Le Tourneau, Inc., 2399 South Mac Arthur, Longview, Texas.

For more details circle 109 on Enclosed Return Postal Card.

Koehring's New Products Displayed

Twelve new items, together with well-known older products, were presented on September eighth in a special show for the press and banking fraternity at Koehring Company's research testing grounds thirty miles west of Milwaukee.

Seven of the new machines have been announced in previous issues of Roads and Streets. These are: the 435 Truck Crane, the 545 Sprawler," the Model 100 "Dumptor," the new Transverse Finisher, the Parsons 77 "Trenchliner," the Kwik-Mix R 18 "Moto-Bug," the Kwik-Mix 6-PM Mixer.

Announcement was made at the show of the purchase of the business of Ka-Mo Tools, Inc. of Cicero, Ill.—the Ka-Mo earth auger to be made now by Kwik-Mix Division of Koehring Company.

Ka-Mo Tools, Inc., Cicero, Ill.

For more details circle 110 on Enclosed Return Postal Card.

Backhoe

Full-cycle speed and a new "Lifetime factor" in the 180-degree uninterrupted swing are two important features claimed for the new Shawnee 88. The machine's double-

(Continued on page 123)

Improved Grader Blade

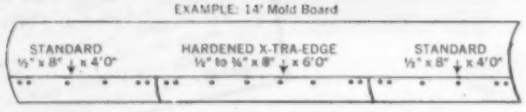
To reduce crown wear on grader blades, save maintenance costs, and improve grader operation, Paper, Calmenson & Co. have developed a 3-piece arrangement in which the center section is thicker and harder tempered than the end sections.

The combination wears longer and stays straighter than the old two-piece blades, which wear down in the center or crown excessively, due to the weight of the machine being on the center of the moldboard and also to the fact that the moldboard center works on the high and hard part of the road. Savings result from lessened blade waste, reduced down time for blade changes, and even from the fewer plow bolts used for fastening. It is stated that field tests over a 4-year period show savings from 40 to 60% in blade costs.

The new blades are 8 in. wide with standard blade curvature. End sections are of unhardened material, usually ½ in. thick, while the center is of "Pacal X-Ta-Edge" steel developed by Paper, Calmenson for this specific purpose. It is available in various thicknesses and any desired length. The section here shown is ½ in. thick on top and ¾ in. on bottom.

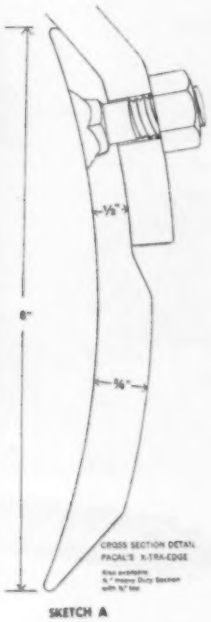
Paper, Calmenson & Co., County Road B and Walnut St., St. Paul 13, Minn.

For more details circle 111 on Enclosed Return Postal Card.



Pacal's new 3 piece, flush joint blade arrangement is also available with ¾" to 1¼" hardened X-TRA EDGE center section and ½" standard blade sections at each end. Combinations for all mold board lengths

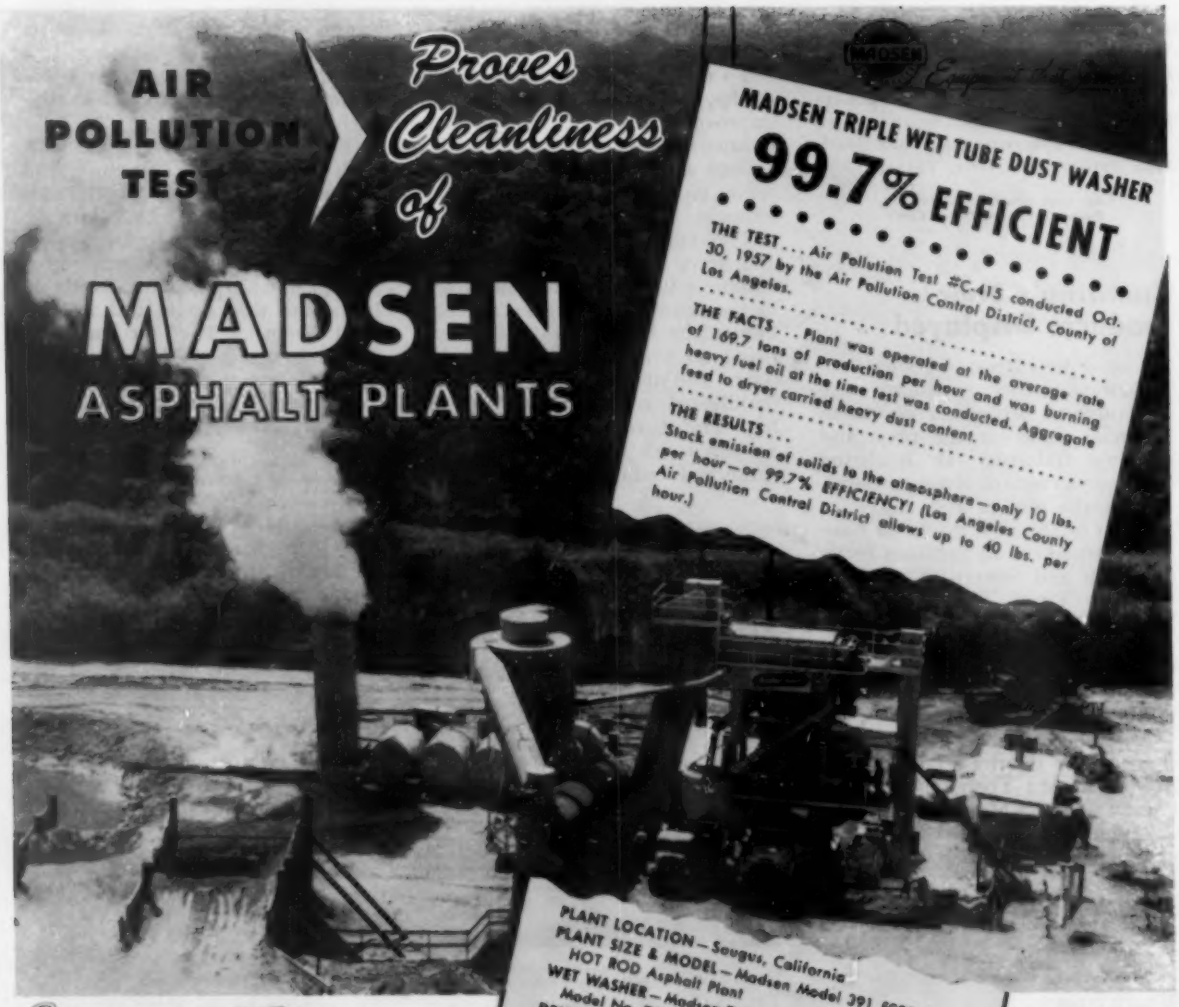
DIAGRAM B



SKETCH A

Blade Arrangement with Paper, Calmenson "Pacal" Center.

The Koehring—Parsons—Kwik-Mix Assembly—September, 1958


AIR POLLUTION TES
Proves Cleanliness of
MADSEN
ASPHALT PLANTS
MADSEN TRIPLE WET TUBE DUST WASHER
99.7% EFFICIENT
THE TEST . . . Air Pollution Test #C-415 conducted Oct. 30, 1957 by the Air Pollution Control District, County of Los Angeles.
THE FACTS . . . Plant was operated at the average rate of 169.7 tons of production per hour and was burning heavy fuel oil at the time test was conducted. Aggregate feed to dryer carried heavy dust content.
THE RESULTS . . . Stack emission of solids to the atmosphere—only 10 lbs. per hour—or 99.7% EFFICIENCY! (Los Angeles County Air Pollution Control District allows up to 40 lbs. per hour.)
PLANT LOCATION—Saugus, California
PLANT SIZE & MODEL—Madsen Model 391 5000-lb. HOT ROD Asphalt Plant
WET WASHER—Madsen Triple Wet Tube Dust Washer Model No. 7809
DRY DUST COLLECTOR—Madsen 12' dia. round cyclone
DRYER—Madsen 84" x 30'

Industrial Asphalt

Industrial Asphalt, Los Angeles, California, owns and operates the Madsen Model 391 HOT ROD Asphalt Plant shown above. Plant is located at Saugus, California.

MADSEN Asphalt Plants are built in capacities from 1000 lbs. per batch to 6000 lbs. per batch. Whatever your asphalt plant requirements are, there's a MADSEN Plant designed for you.

We've talked about the clean operation of MADSEN Asphalt Plants . . . and now here's the proof. Even under adverse operating conditions MADSEN Asphalt Plants meet the strictest requirements for clean operation!

The MADSEN Model 391 HOT ROD Asphalt Plant (shown above in full operation), is streamlined in appearance with no extras or "trimmings." It is designed for easy transport and fast set-up, yet it is ideal for the operator who wants to set up permanently.

Here are some of the outstanding features of the MADSEN HOT ROD:

- Fully-enclosed (running in oil) gear box reduction unit that connects right to the mixer shafts . . . eliminates exposed mixer timing gears.
- MADSEN Twin-Shaft Pug Mill Mixer (patented) with externally removable sectional liners, improved mixing and faster discharge.
- Exclusive bin design (Pat. Pend.) eliminates segregation.
- MADSEN Asphalt Pressure Injection System (patented) for faster asphalt injection, improved mixing and reduced mixing time.
- Fast air operation of bin gates, weigh-box gate, asphalt pressure injection and mixer gate.
- *And, of course, CLEAN OPERATION to meet air pollution requirements everywhere.*

Built in capacities of 4000 lbs. and 5000 lbs., the MADSEN Model 391 HOT ROD Asphalt Plant has shown an ability to produce in excess of 200 T.P.H. at a highly consistent rate. Ask your MADSEN Distributor for Catalog No. 391 or write MADSEN WORKS, Baldwin-Lima-Hamilton Corporation, P.O. Box 38, La Mirada, California or Baldwin-Lima-Hamilton Corp., Lima, Ohio

FOR YOUR CONVENIENCE—MADSEN MAINTAINS A COMPLETE PARTS STOCK IN LOS ANGELES AND LIMA, OHIO

THE MADSEN LINE OF PRODUCTS
FOR THE ASPHALT PAVING INDUSTRY

ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

BALDWIN BLH LIMA-HAMILTON

MADSEN WORKS
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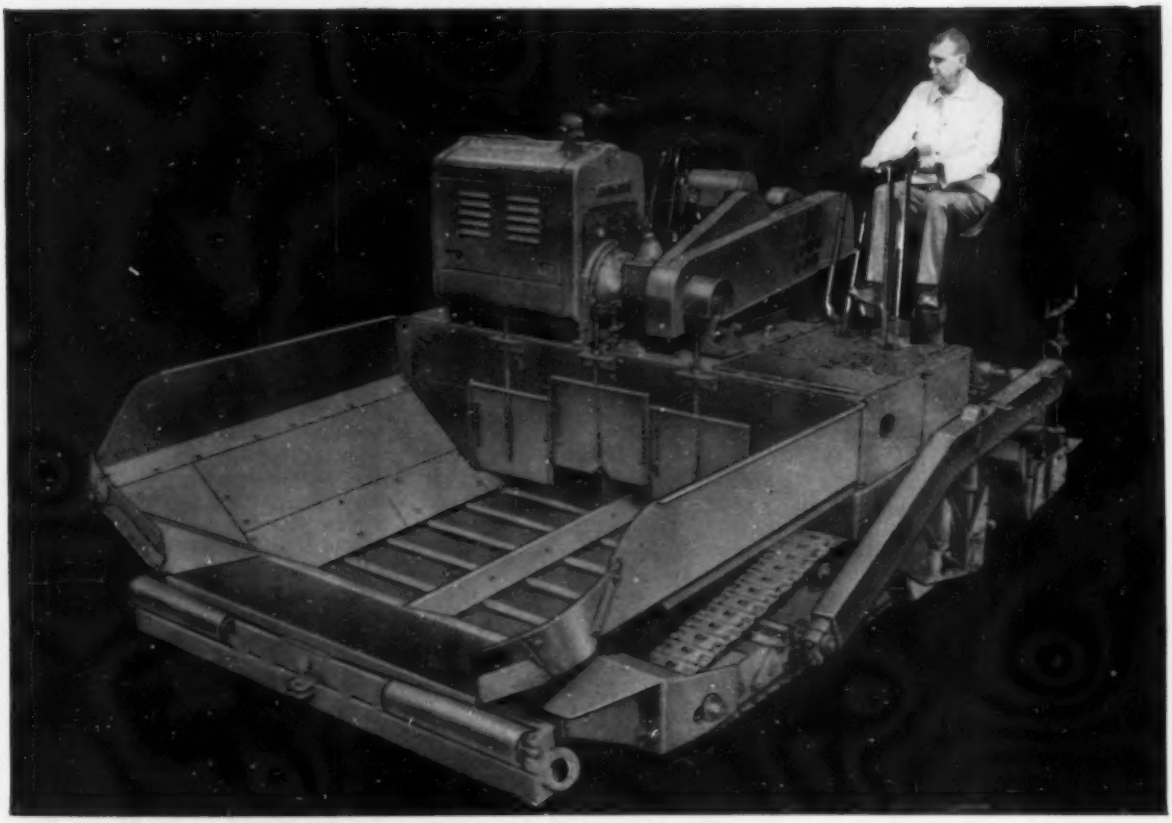

The new Barber-Greene Model 879-B Asphalt Finisher offers many new advantages. Write for literature.

New Barber-Greene Finisher gives higher speeds, greater tonnage, lower costs

The new Barber-Greene Model 879-B Finisher gives fastest, lower-cost asphalt paving.

New faster paving speeds — 45% faster paving speed plus wide speed selection to match all conditions and all plant capacities.

New faster travel speeds — four miles per hour, both forward and reverse. No time consumed in maneuvering on job, turning around for runbacks.

60% greater hopper capacity — no dead areas. Hopper feeds all material to spreading screws.

New high-speed tamper — gives 25% speed increase for faster paving, longer life, greater compaction.

New engine and transmission — provide 25% more power . . . top capacity for every paving application, with reserve for heavy trucks and steep grades.

New crawler design — gives maximum traction on all bases, maximum maneuverability, increased life, less maintenance, smoother operation.

New longer-life screed — special abrasion-resistant, heat-treated alloy steel.

New screed heater — gives quick, even heat and automatic ignition.

Other features of the new Barber-Greene 879-B Finisher: automatic leveling • ingenious thickness control • fast crown adjustment while paving • dual controls, with new dual master and tamper clutch levers • full visibility of entire paving operation • easy, accurate control of material flow • three adjustable hopper gates • basic 10′ paving width variable from 8′ to 14′ • heavy-duty design and rugged construction • quick, easy lubrication • adjustable charging height • lays all asphalt mixes • world-wide parts and service.

Write for literature on the outstanding asphalt paving machine. 58-37-F

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

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ANALYZING COSTS FOR
Electrically Heated Asphalt Plants

By William W. Sellers

The Sellers Company, Ardmore, Pennsylvania

THE two most important questions we can ask on electric heating of an asphalt plant are:

Why should a manufacturer of bituminous concrete choose electric heat for heating his asphalt handling system and mixing tower? Also, how does electric heat compare competitively with a fuel fired system?

In order to answer these questions let us take a look at what might be considered a typical black top plant.

The theoretical plant we are to consider has a 2-ton mixer which can produce at a maximum rate of 120 tons per hour. It will have two asphalt storage tanks, 10,000 to 15,000 gal. capacity each. It will also have two asphalt pump and strainer units.

If the operating season is anticipated to be 8 months duration, or 240 continuous days actual operating days would number approximately 150. The anticipated average production per year is 50,000 tons of mix at an average rate of 100 tons per hour, or 500 hours of actual producing time in a season.

The asphalt is to be delivered by truck at an average of 350° F. or higher. The asphalt to be used in the mix will be between 280° F. and 300° F. The cost of power to operate this plant is to be 3 cents per kilowatt-hour, plus a $1.00 charge for each demand kilowatt per month. To operate this plant our manufacturer would expect to have an average of 150 kilowatts demand charge per month, and a use charge for operating the plant for a season based on 100,000 kilowatt-hours, and would expect to pay the power company for this power $4,200 without consideration for electric heat.

From a talk delivered before the Interstate Power Club, New York City, May 12, 1958.

Now, let us see what is required if we equip this plant with electric heating equipment. We will require 12 kilowatt heaters for the mixers; 4 kilowatt heaters for the way bucket; 2 kilowatts for each pump and strainer assembly; 36 kilowatts for each insulated tank; and 8 kilowatts for the pipeline system—say 100 kilowatt installed capacity for heating the asphalt handling system electrically.

What will it cost to operate this system? Say we turn on our electric heat at the beginning of the season and let it run for 240 continuous days, the duration of the season. We have seen it estimated this way—

"100 kilowatt hours installed times 24 hours per day times 3 cents per kilowatt—equals $72 per day; times 240 days per season, equalling $17,280 per year; plus 100 demand kilowatts per month, times $1.00 per kilowatt, times 8 months for a demand charge, giving a total operating cost of over $18,000 per year for electric heat.

This is very much in error, as the installed capacity is a measure of neither the demand charge required nor the kilowatt-hours to be used.

• Let us take a closer look at what might be required.

If we use two 15,000 gal. tanks, each having 941 sq. ft. of surface, and if we use 3 in. of insulation, we should anticipate a heat loss equal to 8.5 kilowatt-hours loss per hour per tank; for two tanks 17 kwh per hour loss.

If we should decide to use 10,000 gal. tanks (770 sq. ft. of surface), with 4 in. of insulation, our loss per tank would drop to about 5.4 kwh per hour loss per tank, or a total loss for the two tanks of 10.8 kwh per hour. This is with 1 in. of insulation on the pipeline, insulation on the pump and strainers, but nothing on the way bucket and mixers. Here we should expect to lose approximately 30 kwh per hour. By putting 2½ in. insulation on the pipeline and just a nominal amount of insulation on the way bucket and mixer, we could reduce our loss to approximately 10 kilowatt hours per hour loss or less.

Now, for a moment, let us consider what our cost would be if we used two 15,000 gal. tanks, with 3 in. of insulation and put 1 in. of insulation on our pipeline system, but no insulation on the mixer and way bucket.

The cost of heating the two tanks per day would be $12.24, for the pipeline pug mill, $21.60; for electric heating, $33.80; or if left on for 240 continuous days, would equal $8,117 per season, plus a possible 100 kilowatt demand charge for 8 months, or additional $800. The total cost for electric heating, thus would appear to be approximately $9,000.

What can be done to further reduce the apparent operating cost?

Well, first of all, we can very much reduce, or eliminate the demand charge entirely.

We can put 7-day program clocks in the control panel that controls the tank heaters, to take advantage of night or off-peak heating; or interlock the tank heaters with one of the larger motors of the plant so that the tank heaters will not function while the plant is operating.

Likewise, we can interlock the mixer and way bucket heat with the mixer motor. When the mixer is operating and hot material is flowing through, supplementary heat is not required. When the mixer motor would shut down the way bucket and mixer heat would come back on, maintaining the components in ready standby.

Also, we can interlock the pipeline, and the pump and strainer

heat with the pump motor control, for as long as we have hot material flowing through the pipeline we again do not require supplementary heat.

By using 10,000 gal. tanks with 4 in. insulation, instead of 15,000 gal. tanks with 3 in. insulation, we would save about $4.46 per day or $1,070 per year.

If we put 2½ in. of insulation on the pipeline system and insulate the mixer and way bucket, we would save an additional $14.40 per day, or $3,456 per year, bringing the total saving to $5.526 per year.

Our operating cost now appears to be less than $3,600 for electric heat for the entire season, which is about what we would expect to pay to keep our plan in ready standby for 240 continuous days.

Now, if we are to produce 50,000 tons per year we will use about 750,000 gal. of asphalt delivered to our tank storage at 350°, or some 50° hotter required for our mix. The 50° differential figured over 750,000 gal. represents the equivalent of 45,755 kilowatt-hours, which might be used to offset the normal heat losses of the tanks.

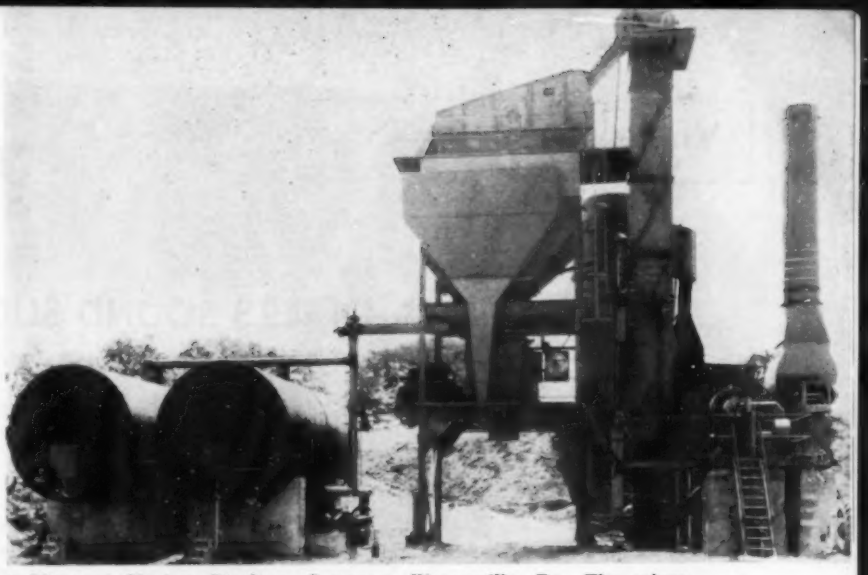
If we consider that we can take advantage of only one-half of this excess heat, we would have a power saving of about $686 per season. This would bring our year's cost for electric heat to less than $3,000.

Next to be considered is the fact that we will not be heating the pug mill and, if so arranged, the pipelines, pumps and strainers, for the 500-odd hours it takes to produce the 50,000 tons of material.

Also, there might be periods during the season when it is only necessary to keep one tank in service. Then again, during some of the colder months of the year the manufacturer may wish to shift to a cut-back material which is sustained at a much lower temperature—all of which would represent additional reductions in our over-all power cost.

There are other heat loads which have not been brought out here, such as the cost of heating the cold tanks at the beginning of season. If the tanks were shut down when the quantity inside the tank was at a low level, the initial energy used to heat the cold plant at the beginning of the season would not amount to much.

It would follow from the above that, with 50,000 tons produced and power costing 3 cents per kilowatt, and $1.00 for demand KW, with an adequately designed system together with intelligent operation, the total power bill per year might run approximately $6,900 which is the cost of electric heat at approximately $2,500.



● **Plant of Harlem Blacktop Company, Wescosville, Pa. The mixer, weigh bucket pipe line system, the two pump and strainer assemblies and the storage tanks are all heated directly electrically and adequately insulated. The plant is a product of McCarter Iron Works, Model M-5000 (2½ ton) with air tumbler wet collector.**

The point I have tried to bring out here is that, in reality, more can be spent or saved by the design and operation of a system than the relatively minor difference in power rates. The comparison should be based on the total cost of operating an adequately designed electrically heated system and its advantages as it compares with other systems under consideration.

The electrically heated system is push-button operated, and automatically controlled. If the plant is doing an over-the-counter type business there is real advantage in having the plant always in ready standby, and always reliable.

A plant owner realizing an average gross profit of $2.50 per ton, with a plant that can average 100 tons per hour, stands to lose $250 per hour should the equipment fail to operate when required. By the loss of a full day's production he could lose more in dollars than it would cost to electrically heat his plant for an entire season.

Aluminum Truck Mixer

A Transcrete 2-yd. truck mixer made almost completely of aluminum was displayed for the first time at the National Ready Mixed Concrete Show in Chicago, February 10-13. The mixer was built by Construction Machinery Co. in cooperation with Kaiser Aluminum & Chemical Corporation and is purely experimental. Being tested is the possibility of substantial savings in operational cost due to reduced weight. The machine will be tested to destruction to determine how and where light weight material can be used to advantage. There is no immediate plan for commercial production.

● **Aluminum Transcrete truck mixer on display at National Ready Mixed Concrete show last winter.**

An illustrated booklet on the new aluminum Transcrete, entitled "Exploring Tomorrow", can be obtained from Construction Machinery Co., Waterloo, Iowa.

Consultant Firm Expands Operations in Alaska

Tuttle Engineering, Inc., Arcadia, California, has expanded its Alaska Division to 125 employees. Tuttle's engineers, draftsmen and computers are now engaged in surveying and engineering roads, highways and bridges in some of the most remote portions of Alaska under a new $600,000 contract from the Army Corps of Engineers. Their work will take them as far as 1,400 miles from the Alaskan base of operation, said Leo L. Strecker, Tuttle president.

Views and Comments

. . . By H. G. Nevitt

THE NBCA OFFERS SOUND SUGGESTIONS

WE were greatly interested in the remarks made at the Las Vegas meeting of the National Bituminous Concrete Association earlier this year. This interest is twofold: first, due to the merits of the proposals and secondly, because of the source from which they came. Not too many contractors—or, for that matter, men in the materials group—have given evidence of realizing the merit of the suggestions made at this meeting.

A highly important point is that made by Mr. Hayes, that the hot-mix contractors' real competition is not with each other but with other pavement types. Asphalt surfacings are in the majority, but they do not always get the majority of the available highway construction funds. This is particularly true in states with large construction budgets: the smaller, or poorer, states use practically 100% bituminous construction, due to both awareness of its merits and the need to stretch their dollars over a large mileage whether the traffic is heavy or light. However, there are many geographic areas in which other types are favored, for reasons which are highly controversial. Much can be done about this by an aggressive campaign supported not merely by the asphalt people but by all the interests concerned with bituminous construction.

A point of even greater interest, but in some ways corollary to the above, is the suggestion that the bituminous contractors produce a better product regardless of whether such is demanded by specifications or similar. Every consumer—which means every one of us—knows that the acceptance of any article is determined primarily by its quality and secondarily by its price. In our view, there would be practically no other type built than asphalt pavement if the past design and construction of the bituminous types had been in every case the best possible from the available funds. Furthermore, such attention to quality will not merely increase the market for the asphalt paving contractor's product but likewise tend to take care of the excessive competition with which he now contends. Really good bituminous roads require skills and equipment not easily obtained, and fewer bidders by far would be represented if top quality standards were mandatory.

The suggestion that such action originate with the contractor seems surprising to many. However, what other course of action will produce the necessary results? Every engineer, every contractor is well aware that the state highway departments cannot at present really provide the type of inspection and control that is essential to the best work. The ability to obtain engineers in this field, the availability of those with the experience and competency required, are simply such as to make any such expectation unrealistic. If the contractors will not police their own jobs, or the contractor organizations will not take steps to assure the best possible work on every project, considerably less than this can be expected despite the greatest possible efforts of the highway administration and its representatives. At the present time negligible savings are being realized on the job due to skimping, or refusal to take the pains required to produce the best work. There are many other steps which the contractor could take if he cared enough. The present attitudes result in a product which occasionally is sufficiently inferior in quality to help the continued existence of competing types.

Another fine suggestion is that the entire process of building a bituminous pavement be given careful scrutiny. Our previous discussions have frequently pointed out the need for better engineering or control in many phases of this procedure, and any program such as suggested will undoubtedly be extremely fruitful. Some rather formidable problems may be encountered in attempting to do the full job, but we will never get them out of the way until a start is made.

We are greatly interested in the avowed intention of NBCA to work for better asphalt quality and specifications. We think the record clearly warrants the feeling among all concerned with asphalt that progress in quality and quality specifications has been undoubtedly slow. We have ventured the opinion in previous discussions that improvement in bituminous design will not come as rapidly as it should until there is widespread understanding by everyone concerned with asphalt pavements as to the need for such action. Possibly the same can be said of asphalt quality, and it is therefore heartening to see contractors registering interest in this point.

At the same time we would like to interject a word of caution. The contractor is essentially an individual who gets things done, cutting through known nonessentials and compromising immediate considerations in return for results. Unfortunately, this may not provide the answer to either better asphalt quality or better pavement design. What we need is an understanding of the fundamentals before the answers can all be obtained. Any compromise solution calling for requirements that have no real meaning but merely superficial reasons for their promulgation will complicate and confuse the quality situation rather than improve it. Fortunately, enough data and understanding are beginning to appear to make possible a rational solution to these problems in the near future. We are correspondingly hopeful that the contractors will add their efforts to the others now in this field to accelerate the solving of the problems involved to the maximum degree possible. However, we trust that they will make certain that the recommendations finally reached really represent progress and are

not merely further stopgap solutions, since such in the end tend to bar the way to the real answers.

The contractor controls the biggest share of the highway construction dollar. He has the most to gain from advances in the art of building bituminous roads, from better quality in the finished product, and from all the other things that mark an advancing industry. It is encouraging to see this group facing up to their real problems and showing an understanding of just what these are. In a free enterprise system an industry advances in proportion to the service it renders the public. The contractor can perhaps do more than any other member of the group concerned with building roads to speed up these advances. We look forward with great pleasure to more thinking and further developments of the type in evidence at the Las Vegas NBCA meeting.

World Asphalt Congress Being Held in Paris

Asphalt industry technical leaders will gather in Paris, France, October 27-29 for the Third International Asphalt Congress. Program participants will represent ten countries of Europe and Latin America in addition to the United States.

Speakers from the United States are R. O. Wilson, representing the Asphalt Institute, and John Griffith, Engineer of Research of the Institute.

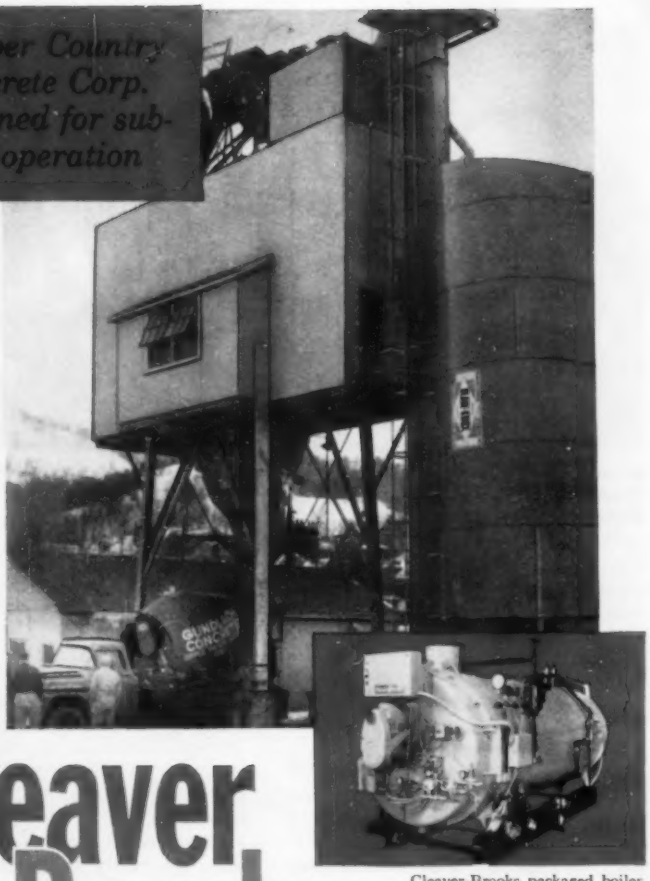
Excursions to see engineering works are planned for the delegates, and special transportation arrangements including discount travel rates are offered to delegates from the United States.

The meeting will be held at the Federation du Batiment, 7, Rue La Percuse, Paris 16. Further details are available from the International Association for Asphalt 9, Avenue Victoria, Paris 4, France, or from The Asphalt Institute, College Park, Maryland.

• Dedication of the new Pacific Coast headquarters building of The Asphalt Institute at 810 University Avenue, Berkeley, California, was the occasion for a luncheon with Institute President J. E. Buchanan from national headquarters as the principal speaker.

Attending were representatives of Institute member companies on the Pacific Coast, headed by E. J. Barnes of Macmillan Petroleum

Copper Country Concrete Corp. planned for sub-zero operation



Cleaver-Brooks packaged boiler — 15-600 hp for steam or hot water applications.

Cleaver Brooks packaged boiler

heats 18,000 gals. water from 33° to 175° F.— Keeps 600 yards aggregate flowing daily in sub-zero weather

Letter from Herman Gundlach, President, Copper Country Concrete Corp.:

"We are most pleased with the new plant and particularly the performance this past winter of our Cleaver-Brooks boiler. We sincerely believe that this boiler is the "Cadillac" of the industry. Our experience to date has proven that.

We built our plant particularly for winter work and in this country, often with 280 inches of snow and temperatures below zero, we had to be well prepared. We therefore installed a 6" reinforced concrete slab on grade of approximately 10,000 square feet in area for the heating of aggregate. The heating of sand and gravel with this jet system was most successful this past winter, often producing for the Al Johnson Construction Company on the Houghton-Hancock Lift Bridge, 400 to 600 yards per day of heated aggregates for this concrete plant, as well as for sand up-bins, etc.

In addition, the Cleaver-Brooks boiler furnished the steam required to heat our hot water with an internal heating coil system in a 1,400 gallon storage tank. We had no trouble maintaining our water temperature at 150° to 175° even though we were drawing it directly out of Portage Lake at 33°. This amount of water is approximately 18,000 gallons per day. We also used the boiler to clean the carriages of our vehicles.

With all this full-load capacity the Cleaver-Brooks boiler has never been overworked."

For information write Cleaver-Brooks Company, Dept. L, 395 East Keefe Avenue, Milwaukee 12, Wis.

Cleaver Brooks

ORIGINATOR AND LARGEST PRODUCER OF THE PACKAGED BOILER

. . . for more details circle 259 on enclosed return postal card

● Seen at the Asphalt Institute's Pacific coast building dedication, J. E. Buchanan, president, E. J. Barnes, regional vice president and B. A. Vallerga, managing engineer.

Corporation who is currently regional vice president of the Institute. Many local engineers and civic leaders were also present.

The Asphalt Institute is an international association of asphalt producers to advance the use of asphalt through programs of engineering, research and education. It was organized in 1919 when the total asphalt production in the United States was under 2 million tons. Today annual production approaches 20 million tons, representing a dollar volume exceeding $350 million.

Paving Foreman Buried In Hot Asphaltic Mix

A road paving foreman, Cuartis Switzenberger, of LaCrosse, Wis. was critically burned recently when buried alive in a pile of hot blacktop mix.

According to a news dispatch Switzenberger while directing his crew in the paving of a parking lot at Eau Claire, Wisconsin, was standing near when a truck loaded with mix struck a paving machine. The truck overturned, spilling the mix on to the foreman and fellow workers.

Procedures for Testing Soils

Compilation of ASTM Standards (D-18). 552 pages, paper cover, 6x9 in. Contains 112 methods for testing soils—39 new and 12 revised since the last edition of this publication in 1950.

The science of soil mechanics is a complex one, due to the very nature of the materials involved which vary not only geographically but locally as well. This variability of soils makes it especially difficult to develop standard methods of test that can be universally used for evaluating the engineering properties of soils.

ASTM Committee D-18 on Soils for Engineering Purposes sponsors this publication, which includes all existing ASTM standards on testing soil. These standards are the result of general agreement and acceptance. Together with these standards are included proposed and suggested methods of test that have generally received wide recognition in the United States.

This publication is considered to bring together conveniently all of the various methods now in use. The procedures are grouped into five categories, each pertaining to related phases of soil testing, as follows: (1) Soil Explorations and Sampling of Soils; (2) Physical Characteristics, Physio-Chemical Properties, and Identification of Soils; (3) Physical and Structural Properties of Soils; (4) Special and Construction Tests; (5) Soil Bearing Tests, Dynamic Properties of Soils, and Load Tests.

Copies of this book may be obtained at $6.75 from the American Society of Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

Army Engineers Developing Revolutionary Tractors

Two special tractors, designed to meet the need for Futurarmy Engineer vehicles, are under development by the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia.

Rubber tired and crawler versions of ballastable machines, the new tractors have multi-purpose capabilities and can be air transported and air dropped. Unlike commercial equipment which continues to become bigger and heavier in order to move or haul dirt more cheaply, the new Engineer units are designed for increased mobility, reduced operator needs, reduced maintenance skills, reduced need for transport vehicles of all types, and reduced logistical support.

The rubber tired version (ballastable all-purpose tractor) or BAT now is being fabricated by Barnes-Reinecke, Inc., Chicago, Illinois. One feature is its easily detached front and rear sections which permit insertion of different body configurations, such as cargo body. This is made possible by use of a rear mechanical drive system and electrical assist on the front drive system.

When ballasted (with dirt, it is capable of performing dozing and prime moving operations with twice the work potential of present day machines of the same size. Can be used as a conventional motorized scraper and can perform the functions of a dump truck without the necessity for crane shovel or loader equipment. It can perform rough grading operations by use of the scraper bowl or dozer blade, be adapted to transport supplies and personnel. Detached into individual loads, its basic sections can be carried by helicopter.

Aerial Methods Pushed in Michigan Program

In announcing that photogrammetric services would be used in all phases of highway construction in Michigan, state highway commissioner John C. Mackie said the services are saving more than a million dollars over former methods.

Mackie said his department spent about $75,000 on aerial photogrammetry but that a "new crash program" called for more than $400,000 to be used in the service.

He said first surveys were made at a 95 percent time saving; final surveys at a 30 percent saving; right-of-way planning at a 15 percent saving; road design at a 5 percent saving, and soils location at a 10 percent saving.

Preliminary surveys by standard methods cost about $1,000 per mile, but photogrammetry cuts the average cost to about $40 a mile and cuts time from weeks to hours, Mackie said. He disclosed that his department was planning about 500 miles of highways designed through photogrammetric methods.

New Products

(Continued from page 115)

cylinder swing incorporates a heavy duty chain and sprocket. The cylinders are designed to afford lifetime automatic compensation for any wear in the swing mechanism. As a result, the manufacturer states, there is never any play in the Shawnee 88 swing mechanism, and it never requires adjusting. The quick-detachable bucket is an innovation on the 88. A new linkage design enables one bucket to handle all types of jobs, including straight down spot digging and truck loading. Buckets are available in widths from 16 in. to 36 in. They can be changed quickly and without use of tools.

Shawnee Mfg. Co., Inc., 1947 No. Topeka Ave., Topeka, Kans.

For more details circle 112 on Enclosed Return Postal Card

Fork Trucks

Two new "Ranger" fork trucks of 4,000 and 6,000-lb. capacity introduced by Industrial Truck Division of Clark Equipment Co. are designed for high speed handling and tiering over sand, mud and rough terrain. They feature high lift speeds and bi-angular steering for complete maneuverability.

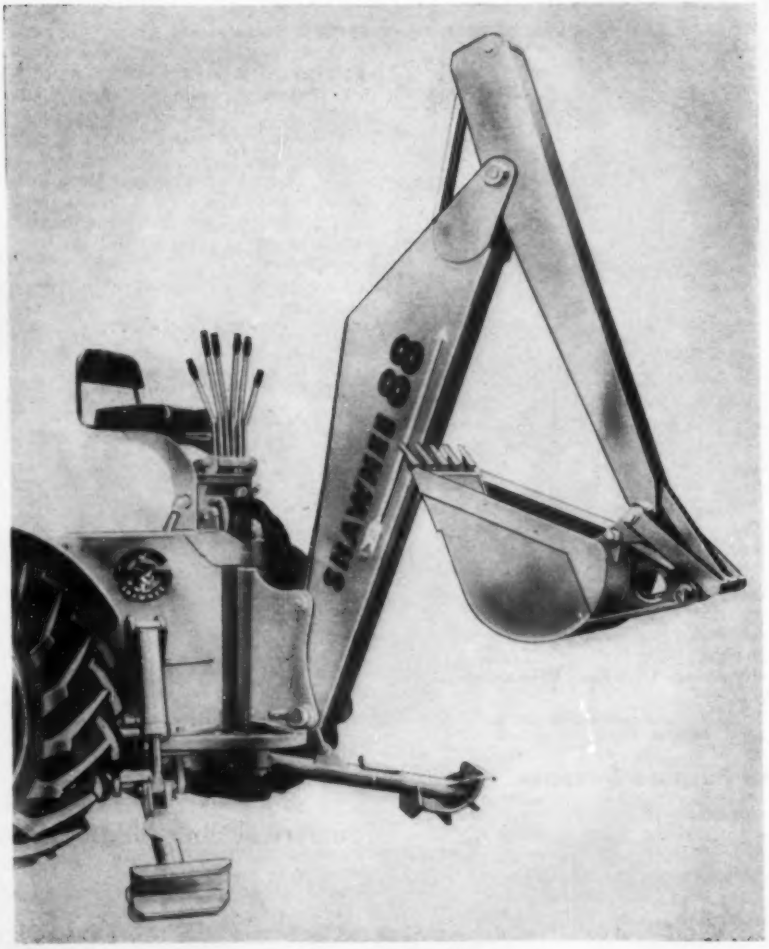
Equipped with both two-wheel and four-wheel drive, the "Ranger" trucks have an oscillating rear axle which permits the machines to travel over rutted, bumpy ground and still maintain traction with all four wheels.

"Bi-angular" steering—a combination of standard Ackerman steering and wagon-wheel steer—gives the "Ranger" a short turning radius in spite of its relatively long wheelbase. When the power-assisted steering wheel is turned the rear axle turns 28° and the rear wheels turn an addition 28° giving a 56-degree turn.

Industrial Truck Division, Clark Equipment Co., Battle Creek, Michigan.

For more details circle 113 on Enclosed Return Postal Card.

New Clark Ranger 40



Shawnee 88 Backhoe

Truck Tire

A pneumatic industrial tire with steel cord breaker construction has been placed on the market by The Goodyear Tire & Rubber Co. Named the "Steel Guard Industrial", this tire features a puncture-resisting barrier of two criss-crossed steel cord breaker strips, locked firmly in place beneath the tread by specially-compounded rubber. The tire is recommended primarily for use in operations where sharp puncturing objects are a hazard and result in expensive downtime.

The Goodyear Tire & Rubber Co., Akron 16, Ohio.

For more details circle 114 on Enclosed Return Postal Card.

Steel Form Stakes

Steel construction stakes with a patented feature of 12 nail holes drilled in a special arrangement providing 24 nail entry points has been placed on the market by DEE Concrete Products Co. They are claimed to be the only stakes that can be nailed solidly to the form board regardless of how much they rotate while being driven into the ground. Another feature claimed for stake is that the holes act as a support for the nails to keep them in place, leaving both hands free for final adjustment and nailing. Made of solid steel rods with specially designed points it is stated they will rapidly penetrate any soil condition, including frozen or compacted ground, macadam or gravel without splitting, bending or breaking and with the least amount of soil disturbance.

DEE Concrete Products Co., 670 No. Michigan Ave., Chicago 11, Illinois.

For more details circle 115 on Enclosed Return Postal Card.

45-Ton Truck Crane

The Koehring 545 truck crane, with a lifting capacity of 90,000 lb, a gross chassis weight (with ring gear) of 49,350 lb, and a total weight of 101,100 lb., has a maximum allowable main boom length of 120 ft, with available straight boom jib extensions of 15, 20,

The 545 Truck Crane

25, and 30 ft. Safety boom limit stops and power boom lowering are standard equipment. There are eight travel speeds forward, ranging from 2.11 to 31.8 mph, and two in reverse—1.91 and 4.4 mph. Steering is with Garrison hydraulic booster.

Engine horsepower is 214 at 2400 RPM. Air brakes are Bendix-Westinghouse. There are two outrigger housings, each with two extendible beams. Forward outriggers are equipped with clearance lights front, rear and on each end. Rear outrigger box is removable.

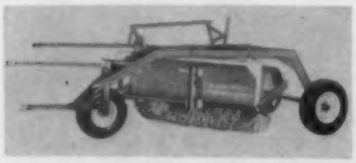
Koehring Division, Milwaukee 16, Wis.

For more details circle 116 on Enclosed Return Postal Card.

All-Purpose Sweeper

An all-purpose sweeper that can be used with any make or size tractor, truck or jeep with power take-off is available from Carson Mfg. Co. It is attached by a simple pin and drawbar connection assuring fast, easy hookup and detaching. The sweeper's broom is mounted on a 35° angle with the front wheel axle and sweeps a path 5½ feet wide. It can be floated or manually raised and lowered in motion for different sweeping levels. The wooden brush core comes filled with either palm or steel fiber and can be reversed end for end for even wear. Tires and tubes are standard equipment.

Carson Mfg. Co., P.O. Box 256, Maryville, Mo.



Carson All-Purpose Sweeper

For more details circle 117 on Enclosed Return Postal Card.

2-Way Mobile Radio

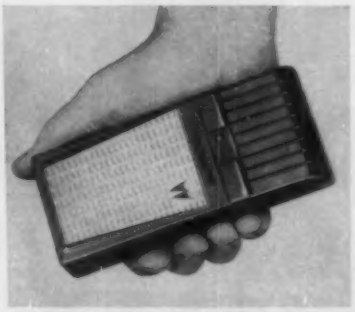
A new "Handie-Talkie" pocket receiver and accompanying "Handie-Talkie" pocket transmitter, introduced by Motorola, extends easy communications capability to the man on foot. The receiver picks up all radio signals on a system's frequency, making possible the immediate contact of key personnel in construction, police, fire and other organizations using 2-way radio.

The entire receiver weighs but 10½ to 12 ounces, depending on the type of battery used. It measures less than 6 in. in length, 2½ in. in width and 1⅛ in. in depth.

The 46-ounce transmitter measures approximately 8 x 4 x 1½ in. It provides a full 1½ watt radio frequency output in the 25-54 Mc. band and 1.0 watt in the 144-174 Mc. band.

Motorola, Inc. Communications and Industrial Electronics Division, 4501 West Augusta Boulevard, Chicago 51, Ill.

For more details circle 118 on Enclosed Return Postal Card.



Motorola "Handie Talkie" Pocket Receiver

Concrete Sawing Blade

A new C-60 tungsten carbide diamond blade, announced by Champion Manufacturing Co., is claimed to cut softer and highly abrasive aggregates without sacrificing blade life. It is stated to do this with a high concentration of diamonds in its tungsten carbide bond.

Champion Manufacturing Co., 2028 Washington Ave., St. Louis 3, Mo.

New C-60 Tungsten Diamond Blade

For more details circle 119 on Enclosed Return Postal Card.

Tractor Shovel

A new four-wheel drive, rubber tired tractor shovel with 7,000 lb. carry capacity, the Model H-70, has been introduced by The Frank G. Hough Co. It is already in production and will replace the Model HH Payloader. Features include more power, more traction, stronger components, greater protection against dirt and dust, more efficient torque-converter, complete power-shift transmission, power-transfer differentials, power-steering, pry-out bucket action, safety boom arms, power-boosted brakes, and numerous refinements. New and more powerful gasoline and diesel engines provide from 105 to 110 h.p. Diesel engines are available in either 2 or 4 cycle types.

Hough Model H-70 Tractor Shovel

The Frank G. Hough Co., 984 Seventh Ave., Libertyville, Ill.

For more details circle 120 on Enclosed Return Postal Card.

50-Ton Truck Crane

A new four-axle 50-ton capacity truck crane has been announced by Construction Equipment Division of Baldwin-Lima-Hamilton Corporation. The Carrier is of Lima design and is available in 8 x 4 and 8 x 6 drives. Special features include, easily removable "pin-on" type front and rear outrigger boxes, roller mounted outrigger beams, full length combination deck-fender design, large full vision operator's cab and full frame width engine compartment. Ease of steering is accomplished through hydraulic power on all four front wheels. Various front end equipment is available. Crane booms are extendible to 150 ft. or 180 ft. including jib.

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio.

Lima Type 64-T Truck Crane

For more details circle 121 on Enclosed Return Postal Card.

(Continued on page 127)

Flying Tigers keep "Big Reach" service working for contractors by using STANDARD fuels

Contractors may sometimes save a job and mark up a profit instead of a loss by using Flying Tigers service to move parts or equipment by air. With a dozer or a batching plant down because of a replacement part needed or when a piece of equipment is idle at one job and vitally needed at another *now*, Flying Tigers can move it.

Flying Tigers operate fast all-freight schedules. Thirteen Lockheed Super H Constellations, each with a cargo-carrying capacity of 43,000 pounds, form the backbone of the airlift fleet. The Super H Connies—like contractor's equipment—use STANDARD fuels.

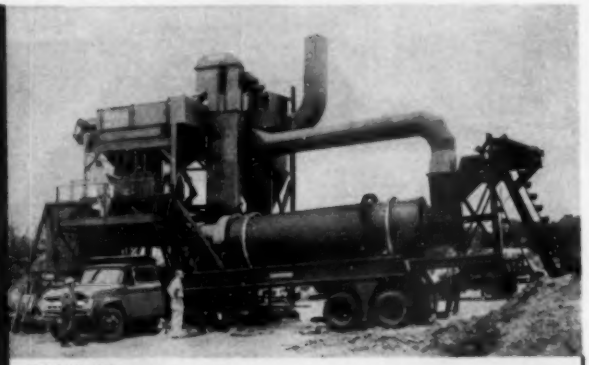
Careful refining plus the use of automatic product quality control devices in Standard's refinery process, assure Flying Tigers—and contractors—that they are receiving top quality petroleum products when they buy from Standard Oil. Get more facts about Standard Oil's ability to serve you from any of the 48 district offices in the 15 Midwest and Rocky Mountain states. **Standard Oil Company, 910 So. Michigan Ave., Chicago 80, Illinois.**

You expect more from **STANDARD** *and get it!*

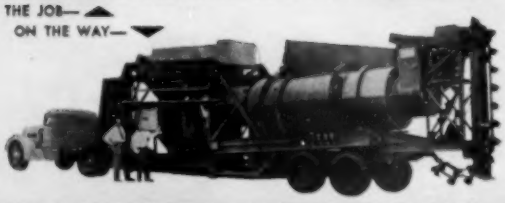
. . . for more details circle 301 on enclosed return postal card

STANDARD

BUILDS THE ASPHALT PLANT TO FIT YOUR NEEDS!



ON THE JOB— ▲
ON THE WAY— ▼



SEMI-PORTABLE AND STATIONARY **R-M** Series

COMPLETELY PORTABLE **T-M** Series

MANUFACTURED IN 2000, 3000, 4000, 5000, 6000, 7000 AND 8000 POUND BATCH CAPACITIES.

Engineered to give fast, efficient, dependable service, the Standard Model R-M Asphalt Plant is BIG—with the Super-lift Dryer, Standard-Symons horizontal vibrating screen, type "S" Hi-Speed Mixer and oversized power units. These are some of the important Standard features which eliminate the usual production bottlenecks.

RUGGED—with built-in stability through the use of heavy pressed steel members, generously sized transmission and bearings, and job-designed wear-resistant alloy metals.

SIMPLE—to operate—no gadgets—*clean* dust seals at all points. *Economical*—low erection, operating and maintenance cost assures more profit year in, year out!

MANUFACTURED IN 1000, 1500 AND 2000 POUND BATCH CAPACITIES.

Standard Model T-M Asphalt Plant—BIGGEST BATCH TYPE ASPHALT PLANT ON WHEELS—the proven answer to low-tonnage hot-mix jobs at remote locations.

Big! Fast! Rugged!... Operators report capacities up to 60-80 tons of hot mix per hour.

Completely self-contained on its own trailer, field proven everywhere for its ability to stand up under the most rigorous conditions. Self-erects from transport position to operating position in less than 60 minutes.

Entire plant can be set up and producing in less than eight hours.

STANDARD STEEL CORPORATION
General Offices & Plant, 5003 Boyle Avenue, Los Angeles 58, California
Midwest Offices & Plant **LEADER IRON WORKS** Decatur 3, Illinois
(Division of Standard Steel Corporation)

STANDARD ASPHALT PLANTS ... *built to do a better job!*

PARTS WAREHOUSES IN LOS ANGELES AND DECATUR, ILLINOIS

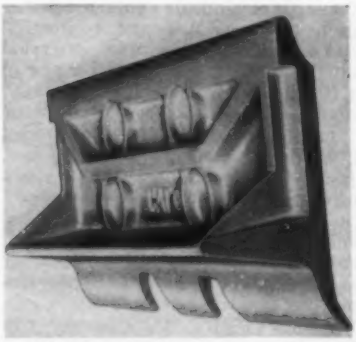
THE NEW "STANDARD" SUBGRADER

Write for information about STANDARD's new DEEP-CUT Subgrader. Takes cuts as deep as 26 inches. Ideal for airport work.

ROTARY DRYERS · KILNS · COOLERS · ASPHALT PLANTS

... for more details circle 302 on enclosed return postal card

(Continued from page 124)



Manganese-Steel Track Shoe

Tractor Track Shoe

A new track shoe, claimed to have the quality of becoming "work hardened" under the continued pounding of extreme applications, has been made available for Caterpillar D8 and D9 tractors.

Designed primarily for work in rock and slag, the new grouser shoes are cast from steel containing 12% to 14% manganese and are said to resist wear better than standard steel track shoes.

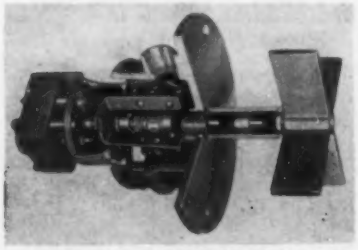
Caterpillar Tractor Co., Peoria, Ill.

For more details circle 122 on Enclosed Return Postal Card.

Bin-Level Control

A new "Bin-Vue" level indicator and control which features an easy-off cover and a fail safe device has been announced by Convair. In operation, a limit switch is activated 18 times a minute and can be connected for visible or audible control. It may also be connected to a relay circuit for automatic control by which failure of any part of the "Bin-Vue" will alter the signal and stop or start other equipment.

Convair, Pittsburgh 26, Pa.



Details of the "Bin-Vue" Level Indicator

For more details circle 123 on Enclosed Return Postal Card.

Electronic Flasher

A new Dietz electronic flasher designed to meet highway hazard warning specifications of those states having special wide-diameter lense requirements provides optimum wide-angle visability over the entire width of the road.

This Model 697 has two plastic shock-resistant 7-in. diameter lenses to provide warning from both directions. It has 16 candle-power and operates at 6 volts, using two standard electric lantern batteries with a life of at least 1500 hours. Preset flashing rate is 60 to 80 times per minute.

Portable and Hazard Lighting Division, R. E. Dietz Co., 225 Wilkinson St., Syracuse, N. Y.

Dietz Model 697 Flasher

Reversible Ratchets

A completely new line of lightweight reversible ratchets has been announced by Owatonna Tool Co. The small, compact ratchet head fits into tight places easily. The simple, reversing mechanism is controlled by a visual positive-control shift lever located on the neck of the wrench.

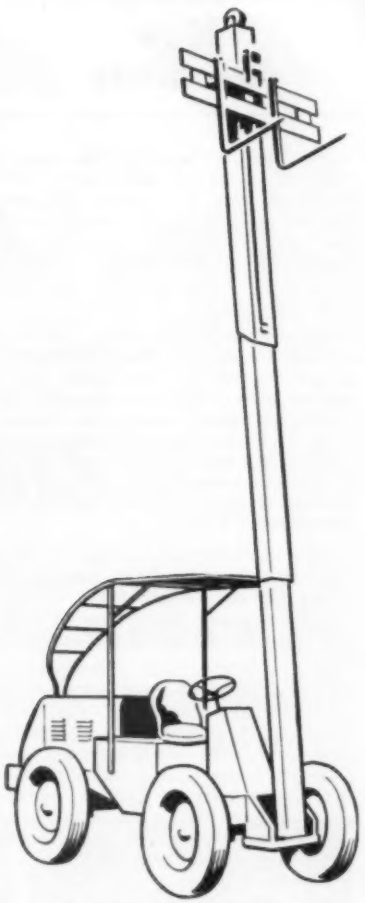
Owatonna Tool Co., 435 Cedar St., Owatonna, Minn.

OTC Reversible Ratchet

For more details circle 124 on Enclosed Return Postal Card.

Telescopic Boom Lifts 2 Tons 22½ Feet

Up to 4,000-lb loads can be raised 22½ ft with the new Kwik-Mix "Hi-Lifter" through use of a three-piece telescopic boom. Top maximum weight lift with the fork truck (to 10 feet and also using a 24-in. load center) is 6,000 lb. The mast is all hydraulically controlled. In addition to its high lift, the telescoping mast allows entrance into low headroom areas and permits good visibility for the operator.



The Kwik-Mix "Hi-Lifter"

Power steering, convenient controls, four-wheel drive and large tires assure good traction and easy movement, even over rough terrain. Top speed for long hauls or from job to job is 18 mph.

Markets for the "Hi-Lifter," are listed as building contractors (for servicing bricks, stone, blocks, mortar, etc. on wall construction, and for unloading and storing supplies); road contractors (for handling forms, charging bins, and yard work); and lumber, building and industrial supply dealers.

Kwik-Mix Company, Port Washington, Wis. In Canada, sales of Kwik-Mix products are handled by Koehring-Waterous Ltd., Brantford, Ont.

For more details circle 125 on Enclosed Return Postal Card.

Four New Wico Items

Wico Electric Co. announces the following additions to its line of ignition equipment for small engines:

Small size 6- and 12-volt "Spinit" batteries for instant starting of ½ to 10-hp gasoline engines. They are dry-charged . . . and pre-measured ingredients for activating are contained in plastic bottles, packed in shipping car-

New Products

ton with the battery. The 12-volt "Spinit," equipped with special non-spill vent caps (to prevent acid leakage on steepest slopes) weighs 23 lb and measures 7¾ in. long, 5⁵⁄₁₆ in. wide, and 7⁵⁄₁₆ in. high.

A new trouble-shooting tool that will tell instantly if the magneto is operating properly—without removing it from the engine. The "Qwik-chek" is not an ordinary spark plug—but a special plug designed to simulate the conditions under which the regular plug fires under engine compression. Simply clip it on engine; snap spark plug wire on test plug; crank engine in normal manner. If test plug sparks, the magneto is OK.

The new original equipment ignition parts packages for dealers—K-11845 for use on outboards and K-11846 for power mowers utility vehicles and small industrial engines.

A new replacement parts package (K-11802) for the repair and overhaul of Model XH heavy duty Wico magnetos. It contains all the parts needed (except the coil, distributor cap and rotor) to fit magnetos installed as original equipment on gasoline engines used on farm machinery, garden and utility power tools, oil field, industrial, construction and road building equipment.

Wico Electric Co., A Division of Globe-Union Inc., West Springfield, Mass.

The 12-Volt "Spinit" Battery

For more details circle 126 on Enclosed Return Postal Card.

Rubber-Mounted Crane, 25 Tons, Travels 18 MPH

Travel speeds up to 18 mph offer high mobility coupled with a 125-ton lift capacity in the new Koehring 305 "Cruiser" crane. Easy "roll-out"

The 305 "Cruiser" Crane

outriggers have screw jacks and pedestals as standard equipment.

One man controls all operations. Booms up to 100 ft can be used on this three-axle unit, with 15 to 30-ft jibs for special high lift service. Safety boom-limit stops are standard equipment, as is also power boom lowering.

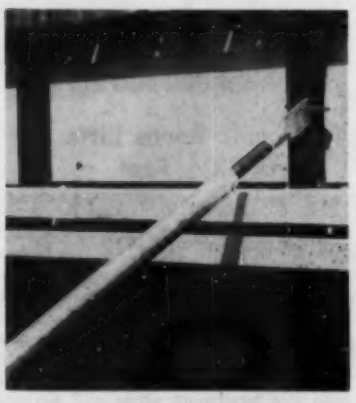
Fast, two-man boom length changes for crane work are possible because of the combination pin-pad boom joints. Bolted pad connections can be used for bucket work where swing stress and strains are encountered. Travel is aided by a folding boom. Four gear ratios and torque convertor provide travel speeds from zero to 18 mph. Brakes on all three axles are air-controlled and can be locked for digging. The swing brake and parking brake are also air-controlled. The 305 has automotive type power steering.

Koehring Division, Milwaukee 16, Wis.

For more details circle 127 on Enclosed Return Postal Card.

Adjustable Form Brace

The adjustable steel form brace here shown is adaptable to either light or heavy construction in that it comes in



Symons Adjustable Steel Brace

regular lengths of 6 ft and 10 ft 6 in. or on special order in 15 or 19 ft. 6 in. for single or multiple pours. It becomes even more versatile and economical when used with the brace extension now available in standard lengths of 4 ft 6 in. and 9 ft or on special order in any size desired by the customer.

Economy is claimed for the steel brace on the basis of indefinite re-use. It also provides more positive alignment and less distortion than was possible under old methods. The brace and brace extension may be used with either Symons forms and hardware or may be used on built-up forms employing wooden stakes.

Symons Clamp & Mfg. Company, 4249 West Diversey Ave., Chicago 39, Ill.

For more details circle 128 on Enclosed Return Postal Card.

New Mail Service for Material Tests

A new "Mail-Test" service applicable to all highway materials is announced by Haller Laboratories. Under it, representative samples are mailed to the nearest Haller laboratory, where chemical and physical analyses are carried out, and report mailed back or called in—if a change is warranted—so that remedial action can be taken fast. The service is available to all governmental or private agencies requiring tests. Laboratories are located at New York, Boston, New Haven, and Plainfield, N.J.

The Haller Testing Laboratories, Inc., 140 Cedar St., New York, N.Y.

For more details circle 129 on Enclosed Return Postal Card.

Fractional HP Motors

Major changes in General Electric Form G fractional horsepower motors will enable users to reduce assembly and maintenance costs in over 1,000 different applications.

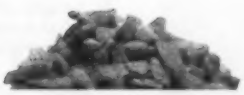
Representing the first major changes made since the Form G design was introduced, the features include plug-in quick-connects for all terminals, reducing wiring requirements; quick change of rotation by simple reversal of the two plug-in motor leads; and brass links that simplify voltage change on dual-voltage motors. An enlarged wiring compartment and a narrower terminal board permit fast hook-ups during installation. An anti-rust treated shaft and bright-plated hardware for protection against corrosion, a built-in lug for convenient grounding connection, and a composition washer in the centrifugal switch for quiet operation are other significant changes.

General Electric, Schenectady 5, N. Y.

For more details circle 130 on Enclosed Return Postal Card.

(Continued on page 130)

Name Your "Hard to Coat" Aggregate

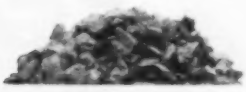


CALIFORNIA
MARBLE CHIPS

OHIO
REFERENCE GRAVEL

MARYLAND
REFERENCE GRAVEL

PENNSYLVANIA
REFERENCE STONE



MASSACHUSETTS
RHYOLITE

OREGON
CRYSTAL SILICA

NEW *CATIONIC* BITUMULS

- **Treats Most Aggregate... Especially "Treacherous" Types Such As Shown Here**
- **Protects Your Cold-Mix Pavements and Surface Treatments Against Early Rains**

CATIONIC Bitumuls,® our new, cold-applied asphalt emulsion, is a truly versatile binder with a "native" affinity for all aggregate, even damp, slick, "hard to coat" gravel and other hydrophilic stone. It also sets more rapidly than conventional road emulsions.

This combination of properties offers definite advantages to the Roadbuilder:

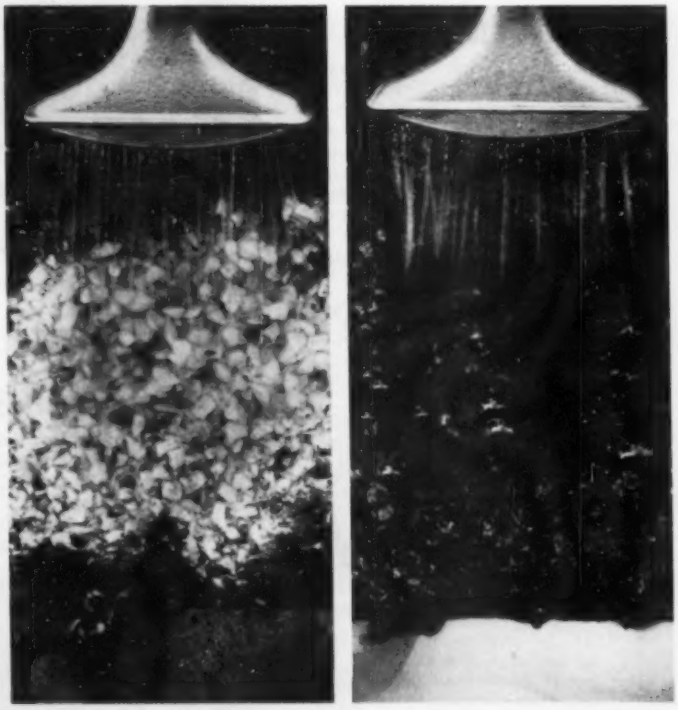
Wider selection in the use of local, often lower-cost, aggregates.

Extended working season . . . better protection against sudden showers.

Faster set permits early rolling of coarse aggregate mixes, and fast opening of pavement to traffic.

Storage, handling and application are much the same with **CATIONIC** Bitumuls as with conventional emulsions; however, care must be exercised in the preparation of storage facilities and application equipment.

CATIONIC Bitumuls is available from certain of our strategically located plants. Our engineers are ready to discuss projects which you may wish to set up for trials of this new product with specific types of aggregate.

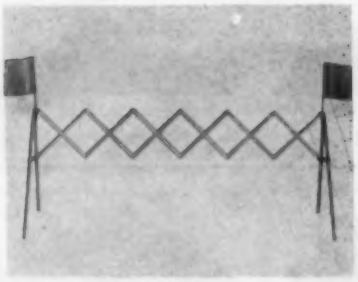


Proof... the superior coating and holding properties of new **CATIONIC** Bitumuls are clearly demonstrated in this test. Note the almost-complete wash-out of the conventional road binder (left); while **CATIONIC** Bitumuls (right) firmly holds the crystal-silica chips used for these test mix samples.

American Bitumuls & Asphalt Company

320 Market, San Francisco 20, Calif. Perth Amboy, N. J.
Baltimore 3, Md. St. Louis 17, Mo. Cincinnati 38, Ohio
Mobile, Ala. San Juan 23, P. R. Tucson, Ariz.
Inglewood, Calif. Oakland 1, Calif. Portland 8, Ore.

. . . for more details circle 239 on enclosed return postal card



"Guard Gate" Extended to 8 Feet

Emergency Barricade

"Guard-Gate", a metal, fold-up type of emergency barricade that can be carried in a passenger vehicle and can quickly be set up wherever needed, has recently been put on the market by West Side Iron Works, a subsidiary of Monarch Road Machinery Co. It is designed for use in highway emergency conditions by police, fire and highway departments, utilities; contractors and public service units to warn traffic of temporary obstructions. Height is 36 in. and the extended width is 8 feet. When not in use it collapses to 9 in. thickness. End posts are black, cross bars bright yellow, flags red.

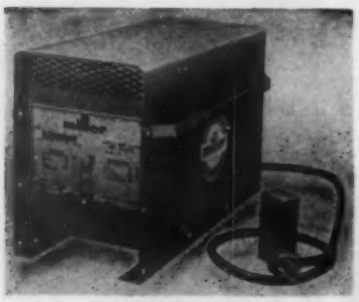
West Side Iron Works, Inc., 327 Front Ave., N.W., Grand Rapids 4, Mich.

For more details circle 131 on Enclosed Return Postal Card.

All-Purpose Electric Unit

A new combination AC-DC transformer-rectifier welder operating from single phase service, is announced by Miller Electric Co. Known as the "Twin", this compact unit delivers two ac ranges (20-115 and 60-180) and one dc range of 40-150 amps. Typical applications are in job shops, garages, small industries and farms.

Miller Electric Mfg. Co., Appleton, Wis.



The Miller "Twin"

For more details circle 132 on Enclosed Return Postal Card.

Blue Ribboner

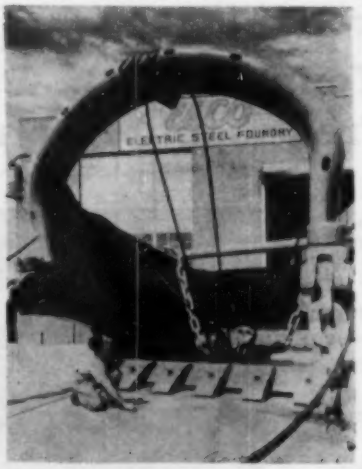
A 69,000-pound tri-tapered dragline bucket, the largest in the world, was recently completed by Electric Steel Foundry Company in Danville, Illinois. It weighs as much as 20 automobiles and has a capacity of 35½ cu yd. The loaded weight will approximate 175,500 lb.

ESCO Alloy 12M and manganese steel castings, along with US Steel's T-1 plate are the materials used in this monster. The drag chain is integrally cast, each link weighing 90 lb; teeth weigh 177 lb each. The castings were made in Esco's Portland foundry and sent to Danville for assembly.

The tri-tapered design facilitates the digging of larger rocks and increases yardage of each bite. This patented design received the Blue Ribbon Mining Award for 1958. Average width of the bucket is 11 ft 2 in.; height from ground to arch, 13 ft 5 in.; and overall length 18 ft 9 in. Operating cables will be 2¾ in. diameter for hoist and 3⅛ in. for drag.

The bucket was built for Central Ohio Coal Company, Zanesville, for use in stripping operations. It is specifically designed for a Marion Super 7800.

Electric Steel Foundry Co., 2141 N.W. 25th Ave., Portland 10, Oregon.



World's Biggest Drag Bucket

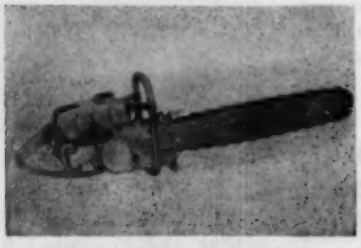
For more details circle 133 on Enclosed Return Postal Card.

Chain Saws—1958-1959 Line

Six models of power chain saws make up the line now being introduced by McCulloch Corporation for 1958-1959. Five of these models are new. They feature advanced engineering improvements designed to give users more horsepower, lighter weight, greater ease in handling and lower over-all maintenance costs.

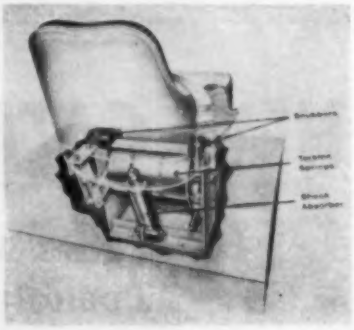
The MAC D30 and D36 models are direct drive, and weigh 17 lb each. The 35A has a 4:22 to 1 gear ratio and weighs 19 lb. Super 44A is a 1:1 direct. Super 55A is adjustable, with 2-2½-3 gear ratios; weight 22 lb.

McCulloch Corporation, 6101 West Century Boulevard, Los Angeles 45, Calif.



The McCulloch Super 55A

For more details circle 134 on Enclosed Return Postal Card.



The "Torsionflex" Seat Mechanism

Caterpillar's Easy Seat

A new system of seat suspension for Caterpillar wheel tractor-scraper units is designed as an approach to "highway comfort" in the severe conditions of off-highway work. It operates with three large-capacity, resilient rubber torsion springs, aligned horizontally, and fixed at one end. The base of the seat is mounted on the other end, and the shock of ground impacts is absorbed by the resilient twisting of the rubber. To dampen oscillation, or the tendency of uncontrolled springs to "over-rebound", a double-acting hydraulic shock absorber has been incorporated.

Designation of the new seat is "Torsionflex". Snubbers absorb the shock if the seat approaches the maximum limit of oscillation on extreme bumps. Tension adjustment provides equally smooth riding for operators whose weights vary from 130 to 260 lb. Seat belts, which are standard equipment on the DW20 and DW21 tractors, are attachable and detachable instantly with a single hand movement.

Comparative oscillograph field tests show clearly the improved riding qualities.

Caterpillar Tractor Co., Peoria, Ill.

For more details circle 135 on Enclosed Return Postal Card.

Sherman-Napco Agreement

Sherman Products, Inc. of Royal Oak, Mich., manufacturer and distributor of wheel tractor-mounted earthmoving, materials handling, and soil preparing equipment, has entered into a working agreement with Napco Industries, Inc. of Minneapolis, for the sale and distri-

The Sherman-Napco Four-Wheel Drive on Heavy Farm Plowing

bution of four-wheel drive units. The unit, which will be known as the "Sherman-Napco Four-Wheel Drive" is for adaptation on conventional tractors to improve operation on difficult terrain. Napco manufactures trucks, auto parts, construction equipment and highway safety appliances, as well as four-wheel drives.

The traction increase amounting, it is said to as much as 40%, will greatly extend tractor usage. Farmers will be able to pull two additional plow bottoms, and will not be hindered by wet fields, as it is practically impossible for the tractor to get stuck. Applications in the industrial field include excavating, materials handling, and snow removal.

Sherman Products, Inc., Royal Oak, Mich.

For more details circle 136 on Enclosed Return Postal Card

Dozer Pioneering Blade

A new pioneering tool that puts the equivalent of 12 rooters on tractor moldboards has been introduced by Electric Steel Foundry Company. This blade, named the "Schnore", is said to out-perform conventionally equipped dozers, and in road work to be faster and less expensive than blasting. In rock and hard packed shale, it can increase tractor efficiency 100% according to the manufacturer.

The blade is made of ESCO 12M, a low alloy steel that is hardenable and highly resistant to impact, shock and abrasion. The saw tooth design, along with the bracing structure behind each tooth assures long performance, and by reducing breakage provides less

Escos "Schnore" Blade

ROSCO'S P.M.*

makes the difference

***P. M. =**
Pressure Metering

Applying bitumen through 2 feet of spraybar as shown may not appear unusual or different, but when the operator can use any length—from 1 to 24 feet—*without changing the pressure* and *without any application adjustment whatever* . . . then there's a difference. It's *Rosco's Pressure Metering Method* that makes that difference.

The P. M. method of applying bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the pump revolutions. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. Here again, Pressure Metering *makes the difference* . . . the rate is automatically maintained by Rosco's P. M. system.

It is this Pressure Metering Master Valve, the "heart" of Rosco Distributors, that gives you this built-in control of pressure which is the only accurate method of obtaining precise bituminous application. This is the valve that also directs the flow of material for all of the Rosco Distributor functions.

Make the difference pay off. Let your Rosco dealer show you how. Write the factory for descriptive bulletins with specifications of Distributors with P. M.

. . . for more details circle 297 on enclosed return postal card

chance of damaging the moldboard on the tractor.

Electric Steel Foundry Company, 2141 N.W. 25th Avenue, Portland 10, Oregon.

For more details circle 137 on Enclosed Return Postal Card.

Portable Sand Washing and Classifying Units

Complete sand washing-classifying-dehydrating sections on wheels are now available from Eagle Iron Works. The new units consist of a standard water scalping-classifying tank with automatic valves and 3-cell collecting-blending flume and two single screw washer-classifier-dehydrators, compactly mounted on a chassis, for use with semi-tractor. Size and weight permit highway travel from pit to pit. Unit can be hauled right into pit and positioned next to crushing and screening plant.

Side flares on washers are quickly removed, as shown, for travel. When site is reached section can be set up for operation within an hour or so.

Simple manual control of metering "splitter" gates on tanks in conjunction with 3-cell flume adapts unit to a variety of pit conditions.

Eagle Iron Works, 140 Holcomb Ave., Des Moines, Iowa

Eagle Portable Sand Plant

For more details circle 138 on Enclosed Return Postal Card.

For Crane and Shovel Safety

What is probably the best insurance so far developed against swing accidents with cranes and shovels is the "Safety Circle" here pictured. While it does not relieve operators of the necessity for care, it prevents any operator from moving unconsciously into a danger zone. Counterweight and front end swing are entirely within the circle radius. Further still, the circle practically blocks any worker or other person from stepping into a "pinch spot." Beside these automatic safety features, the circle provides operators with an easy-access job-view platform.

When equipment is to be moved any considerable distance, the circle hinges upward and locks securely against the side of the cab. A hinged door in the

The "Safety Circle" in Operating Position

circle grillage then provides cab entrance and exit. To drop the device into operating position is said to require only seconds.

Operators on extensive field tests that have been conducted report that the device makes their work definitely easier; and oilers, who it was feared would object on the ground of inconvenience, say that the hard-to-get-at spots actually are easier and safer to reach.

Andrus Machine Works, Eugene, Oregon.

For more details circle 139 on Enclosed Return Postal Card.

Self-Propelled Finishing Bridge

Designed to keep pace with faster moving paving trains in use today, the new self-propelled "Power Traction Bridge" developed by The Cleveland Formgrader Co. travels at a speed of 2½ feet per minute. It is offered as an all-around piece of equipment for finishing and belting, for use as a cross-over and for carrying tools, water and equipment.

Powered by a 2¾-hp, 4 cycle engine, the bridge has a simple reversing transmission operated by a single control. A feature is the ability to operate without attention when once in gear. Also available is a belting mechanism which can be disengaged when not in use. The "Power Traction" unit is available on single finishing bridges, double float bridges and burlap bridges.

The Cleveland Formgrader Co., Avon, Ohio

For more details circle 140 on Enclosed Return Postal Card.

The New "Power Traction" Bridge

Bituminous Concrete

Another important new use for Gilsonite, the natural hydrocarbon found only in the Uintah Basin of Utah, has been announced. The mineral called "Gilsapave" has become the basis for a new cold bituminous concrete. Marketing of the road-surfacing product is now in progress under an exclusive distributors' contract signed with George M. Jones Co., Salt Lake City.

American Gilsonite Co., Salt Lake City, Utah.

For more details circle 141 on Enclosed Return Postal Card.

Front End Loader

A new 4-wheel drive 1¾-cu yd front end loader, the TL-16 "Tractoloader", is in production by Tractomotive Corporation. The 15,850-lb. loader has a maximum lifting capacity of 14,000 lb. and a breakout force up to 18,000 lb.; maximum dumping clearance under the hinge pine of 11 ft. 6 in; under the bucket cutting edge 9 ft. 1 in. Reach from the front of the tires to the cutting edge at maximum dumping height is 2 ft. 8 in. From the front of the frame the reach is 5 ft. Power for the TL-16 is provided by either a 101-hp 6-cylinder Hercules gasoline engine or a 97-hp 6-cylinder Hercules Diesel engine.

Tractomotive Corporation, Deerfield, Ill.

For more details circle 142 on Enclosed Return Postal Card.

SWENSON SPREADERS FOR ICE CONTROL

SPREADS SALT 200 LBS. PER MILE OR IN ANY DESIRED AMOUNT

Lays a Narrow Strip or Full Traffic Lane

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

Write for complete information

SWENSON SPREADER & MFG. CO.
LINDENWOOD, ILLINOIS

. . . for more details circle 304 on enclosed return postal card

Manufactures' Literature

"PEOPLE AND MOVEMENT," a sound-color film aimed at increasing the public's understanding of the planning behind the National System of Interstate and Defense Highways—Portland Cement Association, 111 West Washington, Chicago, Ill. or from the Associations' district offices.

For more details circle 143 on Enclosed Return Postal Card.

DEWATERING EQUIPMENT AND OPERATIONS: Ninety six pages of pictorial and descriptive matter on the dewatering of foundations, tunnels, dam construction and other services. The title —"Stang Wellpoint System" (Revised Edition of Catalog 50-2). John W. Stang Corporation, 8221 Atlantic Ave., Bell, California.

For more details circle 144 on Enclosed Return Postal Card.

RUST CORROSION RATES. A Rust Index of the United States accompanied by map, based on a 25-year study. Nine rates of corrosion ranging from 3 to 15 years on standard test panels are given by areas and for selected cities, together with explanatory text. Rust-Oleum Corporation, 2799 Oakton St., Evanston, Ill.

For more details circle 145 on Enclosed Return Postal Card.

THE CHARLOTTE COLLOID MILL for manufacturing emulsified asphalt is described in a bulletin issued by Chemicolloid Laboratories, Inc., Garden City Park, N. Y. It includes complete emulsified asphalt plant layout covering auxiliary equipment recommended for economical production of top grade asphalt road emulsions.

For more details circle 146 on Enclosed Return Postal Card.

STEEL BUILDINGS: A new folder from United Steel Fabricators, Inc., Wooster, Ohio describes truss type utility buildings available in standard heights of 10 and 12 ft., widths of 26 and 30 ft., and lengths in multiples of 15 ft. or 13 ft. 4 in. Fabrication can be with "clip and wedge" or standard screw fasteners. Door and window positions as desired.

A second folder describes the "Handy Hut" portable, in standard widths of 8, 10, and 12 ft, and a basic length of 8 ft., with extensions available in multiples of 2 ft.

For more details circle 147 on Enclosed Return Postal Card.

ROCK SALT STABILIZATION: Procedure for the improvement of wearing courses, shoulders and road bases with rock salt in a simple 7-step method, using ordinary equipment, is outlined in a 12-page booklet, "Better Roads with Sterling Rock Salt," issued by Sterling Salt Company, Inc., Scranton, Pa. Each step is graphically illustrated by drawings in color.

For more details circle 148 on Enclosed Return Postal Card.

CONCERNING BLASTING: A cost control manual, a cost chart, and a slide computer available from Powder Company, Wilmington, Delaware, are designated as specific aids to efficient and economic blasting. The 16-page manual outlines the subject and gives a breakdown of operations for cost computation. The chart provides a practical form for records or estimates. The computer, in seven slide faces, provides quick answers on footage, spacing, tonnage, powder factor, amortization, days worked, and cost per yard or ton.

For more details circle 149 on Enclosed Return Postal Card.

HYDRAULIC SHOP PRESS MANUAL—16 pages—Owatonna Tool Co., Owatonna, Minn.

For more details circle 150 on Enclosed Return Postal Card.

SNOW LOADERS: An 8-page folder from Barber-Greene Company, Aurora, Ill., showing snow removal operations with equipment designed primarily for construction work and summer maintenance.

For more details circle 151 on Enclosed Return Postal Card.

BROCHURE ON EQUIPMENT LEASING: A new 20-page analysis of the advantages of equipment leasing, including several case histories. United States Leasing Corporation, 130 Montgomery St., San Francisco 4, Calif.

For more details circle 152 on Enclosed Return Postal Card.

PORTABLE POWER: Catalog BU-412, Engine Material Handling Division, Allis-Chalmers Manufacturing Co., Milwaukee, Wis. describes the new G-226 portable, light weight generator set.

For more details circle 153 on Enclosed Return Postal Card.

A NEW LINE OF ALUMINUM TRUCK AND TRAILER DUMP BODIES, announced in a special bulletin from Penn Body Division of Hockensmith Corporation, Penn, Pennsylvania. The series comprises Model 12 and Morgantown-type bodies. Capacity range is from 8 to 40 cu yd.

For for details circle 154 on Enclosed Return Postal Card.

MALSBARY SERVICE DIRECTORY. A revised directory that lists more than 175 authorized service centers in the United States and Canada, has been published by Malsbary Manufacturing Co., 845-92nd Ave., Oakland 3, Calif., maker of steam cleaners and generators. Each center maintains a stock of parts and has a full-time service man available. Each center also has a steam cleaner available to users in emergencies.

For more details circle 155 on Enclosed Return Postal Card.

CALCIUM CHLORIDE INSTITUTE, 909 Ring Building, Washington 6, D. C. offers a 40-page technical manual on the subject "Calcium Chloride in Concrete." It contains data on major effects of calcium chloride relating to its advantages on initial and final set, early strength, ultimate strength, cold weather protection and high early strength cement and air entrained concrete. Several specifications are included.

For more details circle 156 on Enclosed Return Postal Card.

CONCRETE SPREADER: A newly revised bulletin No. 2485R, on its concrete paving spreader from Blaw-Knox Company, Mattoon, Ill.

For more details circle 157 on Enclosed Return Postal Card.

MANITOWOC ENGINEERING CORP., Manitowoc, Wisc.—a 12-page catalog describing its new 1½-yd Model 2300 shovel, convertible to 1½-yd clamshell or trench hoe, 1½-2½-yd dragline, or 35-ton crane.

For more details circle 158 on Enclosed Return Postal Card.

THE ALLIS-CHALMERS D-SERIES "UTILITY" TRACTOR LINE announced recently by the Tractor Group, is presented in pictorial review in a new three-fold catalog, UT-103. Various approved attachments are shown in action. Specifications and dimensions of both the D-14 and D-17 tractors are included.

For more details circle 159 on Enclosed Return Postal Card.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y. new bulletins: GEC-1462B, two pages describing the redesigned 4-lamp, 6-foot, fluorescent luminaire (Form 406S) for street, highway, and interchange lighting; GEC-1486, 8 pages covering the company's complete line of mercury outdoor floodlights. GEC-10051, a 52-page catalog of heaters and heating devices, including space heaters, and miscellaneous units used in construction.

For more details circle 160 on Enclosed Return Postal Card.

THE "MULTI-PULL" TOOL formerly made by Multiple Corporation of Dayton, Ohio, and now manufactured by Indus Corporation, 1815 Madison Ave.,

Indianapolis 25, Indiana, is described in a new catalog from the latter company. Complete diagrams of the device and pictures showing its use in hoisting, pulling, and load-binding operations are included.

For more details circle 161 on Enclosed Return Postal Card.

PARKING LOT DATA BOOK: Better parking lot planning for passenger cars, trucks and busses is the subject of new 32-page data book, "Parking Techniques", by Harris Barrier, Inc., Indianapolis 23, Ind. The book is a guide for designing parking lots of any size or shape for commercial, industrial and institutional use. Nineteen diagrams show space allocations, using the three common parking angles—45, 60 and 90 degrees. Minimum and optimum dimensions for each arrangement are outlined. The firm's complete line of "Har-Bar" parking barriers is described in detail. In addition, the book lists Harris Barrier representatives who offer a nationwide parking lot planning service.

For more details circle 162 on Enclosed Return Postal Card.

FORK LIFT TRUCKS: A new 4-page booklet, BU-481, available from Engine-Material Handling Division, Allis-Chalmers Manufacturing Co., Milwaukee, Wisc., describes features of GS-approved fork lift trucks in the 3,000 to 10,000-lb. capacity range. Illustrations of Underwriters' Laboratories approved safety components help tell the story of these fire-protected lift trucks.

For more details circle 163 on Enclosed Return Postal Card.

RANKIN MANUFACTURING CO., 616 So. Marengo, P.O. Box 631, Alhambra, Calif., has published a 4-page brochure explaining the importance of hardsurfacing welding in preventative maintenance of construction equipment. It points out the "surface wear" problems and tells how Ranite helps in hardsurfacing protection. A new method for keeping records of wear on construction equipment is explained.

For more details circle 164 on Enclosed Return Postal Card.

"INCREASE POWER, PRODUCTION, PROFIT", a new 12-page booklet, Form D841, available from the Advertising Division, Caterpillar Tractor Co., Peoria, Ill., gives a comprehensive discussion of the capabilities of large crawler tractors. The booklet points up the uses of the D8 and D9 tractors in construction, logging, mining, pipe laying and railroad applications. Brief specifications are given for both machines.

For more details circle 165 on Enclosed Return Postal Card.

TRUCK CATALOG: Reo Division, The White Motor Company, Lansing 20, Mich.—A "Model Folder", covering the entire Reo line.

For more details circle 166 on Enclosed Return Postal Card.

"NOT AN ELEMENT OF DOUBT", a new 8-page booklet, DE839, available from the Advertising Division, Caterpillar Tractor Co., Peoria, Ill. gives helpful service tips on filter replacements. Filtering improvements developed by Caterpillar are explained in detail. Booklet contains cost study information coupled with recommendations for extending oil change periods.

For more details circle 167 on Enclosed Return Postal Card.

LITTLEFORD BROS., INC., 453 E. Pearl St., Cincinnati 2, Ohio, has published Bulletin JJ-5 on its Model 101 utility spray tank. It presents facts and diagrams on the redesigned model 101.

For more details circle 177 on Enclosed Return Postal Card.

GROUSER SHOES, TRACK HARDWARE, AND SPECIAL SHOES—"Caterpillar Specialties", a new 8-page booklet from Caterpillar Tractor Company, Peoria, Ill.

For more details circle 168 on Enclosed Return Postal Card.

"ALUMINUM FOR THE HIGHWAY," an 8-page brochure, published by Revere Copper and Brass Incorporated, 230 Park Ave., New York 17, N. Y., describes five advantages of Revere aluminum alloy extrusions for bridge railings. Brochure also describes Revere materials available for use in panel and two types of parapet railing designs. Material specifications are given. The illustrations include bridges in several states showing different types of aluminum railings.

For more details circle 169 on Enclosed Return Postal Card.

RAMSET FASTENING SYSTEM, DEPARTMENT B-126 OLIN MATHIESON CHEMICAL CORPORATION, 12117 Berea Road, Cleveland 11, Ohio, is offering a booklet showing how Ramset powder-actuated tools can be used in highway construction. The booklet explains how the tool can be used in fastening concrete forms in bridge construction and in anchoring curb forms for highways. It also covers fastening of conduit, concrete ties, and drainage pipes and gutters.

For more details circle 170 on Enclosed Return Postal Card.

NEW VIBRATING SCREEN CATALOG: Syntron Company, 384 Lexington Ave., Homer City, Pa.—a new catalog on vibrating screens and associated equipment. The profusely illustrated 14-page booklet contains complete data and specifications for Syntron's lines of standard model vibrating grizzly bar screens, "Concentric-Action" vibrating screens, screening feeder models, standard "Unbalanced Pulley" vibrating screens, standard model electromagnetic vibrating screens, and Syntron shaker screens.

For more details circle 171 on Enclosed Return Postal Card.

ROSCOE MANUFACTURING CO., 3118 Snelling Ave., Minneapolis 6, Minnesota, has issued Bulletin 568B presenting pictures, descriptions and specifications of its Model RMT maintenance unit. It tells how this bituminous distributor performs three different operations.

For more details circle 172 on Enclosed Return Postal Card.

ELECTRIC STEEL FOUNDRY CO., 2141 N.W. 25th Ave., Portland 10, Oregon has announced a catalog of all "Esco" log grapples. Close-up photographs of each model, as well as action shots of each grapple in field use, amplify the text which gives general information as well as specifications of the heel boom, general purpose and pulpwood log grapples.

For more details circle 173 on Enclosed Return Postal Card.

TESTING EQUIPMENT: A 4-page bulletin issued by Soiltest, Inc., 4711 W. North Ave., Chicago 39, Illinois, describes 32 new catalog items for testing soils, concrete and asphalt.

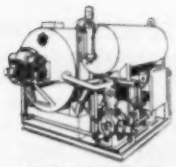
For more details circle 174 on Enclosed Return Postal Card.

TRUCK HOIST: A new classification sheet issued by Truck Body and Equipment Association, Inc., 1616 K Street, N.W.; Washington 6, D. C., will assist operators of truck hoists in choosing the correct one for their specific jobs. The chart covers three broad classifications: hoists for dump trucks, hoists for farm and conversion trucks, and hoists for semi and full trailers.

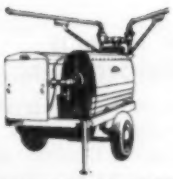
For more details circle 175 on Enclosed Return Postal Card.

HIGHWAY HAZARD LIGHTING CATALOG: Comprehensive information on the uses and maintenance of portable and hazard warning lighting equipment—lanterns, torches, and flashers—is included in the 1958-59 illustrated product catalog announced by the Portable and Hazard Lighting Division, R. E. Dietz Company, 225 Wilkinson St., Syracuse, N. Y. Other catalogs of the Dietz Company cover automotive lighting and safety equipment.

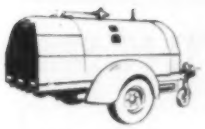
For more details circle 176 on Enclosed Return Postal Card.



HI-HEAT OIL HEATER



BITUMINOUS CIRCULATOR



STEAM GENERATOR

BOUGHT FIRST BROS ASPHALT UNIT IN 1952 BITUMINOUS MATERIALS & SUPPLY CO. NOW OWNS 14

Like success stories? Here's one, or actually two — one for the company and another for BROS equipment.

Bituminous Materials & Supply Company has been steadily increasing plant capacity since 1952 to meet the demands of the growing farm-to-market road surfacing program in Iowa.

Starting with one BROS Circulator, the company now owns 8 of these units, 3 BROS Steam Generators and 3 BROS Hi-Heat Oil Heaters . . . operating at its Davenport, Algona, Spencer and LeMars plants.

Day in and day out dependability through the years—that's the underlying reason why Mr. Claude Ruark, company's general superintendent, relies on BROS bituminous heating and handling equipment. There's no room for downtime during the busy construction season when the plants operate on a 'round-the-clock basis.

Take the Algona plant where 100,000 gals. of Emulsion, MC-1 and 120 tons AC asphalt materials are processed daily:

Raising material temperatures in the two 25,000 gal. storage tanks from 150° F to 300° F is accomplished by this BROS HO-20 Hi-Heat Oil Heater. It circulates hot mineral oil (commercial grade) through 430 ft. of 2 in. coils in the tanks. Fired by city gas, heating cost averages 50 cents per hour on a 24-hour work schedule.

BROS Oil Heaters of all sizes operate at below 15 psi; have fully automatic heating and safety controls and offer a wide range of BTU output.

From April to early June, this BROS Circulator has unloaded over 260 tank cars of bitumens at the Algona plant. In operation since 1954, it provides straight-line transfer from tank car to storage tanks because its special transfer pump moves materials at about 20° F above semi-solid viscosity. Exclusive BROS "Tar Kettle" design surrounds and heats sluggish bitumens from both inner and outer firing chamber surfaces, uniformly distributing the heat and increasing temperatures fast — vital when high temperatures are needed.

Materials in some of the incoming cars are hard to "crack" and that's when the BROS Steam Generator goes to work . . . providing hot, dry steam in 20 minutes from a cold start. Over 76 years of heat transfer experience dictates the 2-pass design behind this speed record. Available are 15, 30, 52 and 60 HP models.

Your nearest BROS dealer will fill you in on all the details. Or write us for recommendations on your plant expansion plans.

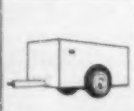
BROS *Incorporated*

ROAD MACHINERY DIVISION

1057 TENTH AVE. S.E.
MINNEAPOLIS 14, MINN.

Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!

SHEEPSFOOT TAMPERS



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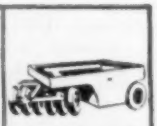

9 AND 13-TON ROLLERS

. . . for more details circle 248 on enclosed return postal card

MEETINGS

NATIONAL SAFETY COUNCIL—46th Annual Safety Congress and Exposition, Conrad Hilton, Congress, Morrison, La Salle hotels, Chicago, Ill., Oct. 20-24.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS—Fall Meeting, St. Francis Hotel, San Francisco, Calif.; Oct. 23-25.

INTERNATIONAL ROAD FEDERATION — Third World Meeting, Mexico City, Mexico; Oct. 26-31.

INSTITUTE OF TRAFFIC ENGINEERS—28th Annual Meeting, Deauville Hotel, Miami Beach, Fla.; Nov. 11-13.

CONFERENCE ON ELECTRONIC COMPUTATION, sponsored by ASCE Structural Division Kansas City Section, Continental Hotel, Kansas City, Mo.; Nov. 20-21.

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—Annual Convention, Sheraton-Palace Hotel, San Francisco, Calif.; Nov. 29-Dec. 2.

THE ASPHALT INSTITUTE—Annual Meeting, Sheraton Hotel, Washington, D.C.; Dec. 1-4.

HIGHWAY RESEARCH BOARD—Annual Meeting, Sheraton-Park Hotel, Washington, D.C.; Jan. 5-9, 1959.

AMERICAN ROAD BUILDERS' ASSOCIATION —57th Annual Convention, Dallas Memorial Auditorium, Dallas, Texas; Jan. 19-22, 1959.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC. — Annual Meeting, Americana Hotel, Miami Beach, Fla.; Jan. 19-23, 1959.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS—Annual Meeting, Brown Palace Hotel, Denver, Colorado; Jan. 26-28, 1959.

NATIONAL CRUSHED STONE ASSOCIATION —Annual Meeting, American Hotel, Miami Beach, Fla.; Jan. 26-30, 1959.

NATIONAL BITUMINOUS CONCRETE ASSOCIATION—4th Annual Convention, Americana Hotel, Miami Beach, Florida; Feb. 2-6, 1959.

California Highway Conference Scheduled

The Eleventh California Street and Highway Conference will be presented by the Institute of Transportation and Traffic Engineering, of the University of California, at Berkeley, January 28-30, 1959.

C. E. Waite, California Deputy State Highway Engineer, will be chairman.

An annual forum covering subjects ranging from broad planning problems to latest developments in engineering and construction technique, the ITTE conference draws attendance from throughout the country as well as from all parts of California.

Texas Road Builders Association Is Formed

Formation of the Texas Road Builders Association as an affiliate of the American Road Builders Association is announced by Rudolph Kraemer, president of the ARBA Contractors Division. Approval of the Texas organization's application for an ARBA State charter was granted by the Division's Board of Directors, meeting recently at Lake Delton, Wis.

In arrangement with the Texas Highway-Heavy Branch of the Associated General Contractors of America, it was agreed that the manager of the Texas Branch-AGC, James M. Richards, will serve as executive secretary of the Texas Road Builders Association. Further, the officers of the Texas Branch of AGC will serve as officers of the ARBA affiliate. The top officers are: E. B. Cape, Gulf Bitulithic Co., Houston, President, and L. P. Gilvin, Gilvin-Terrill, Inc., Amarillo, Vice President. Headquarters are in Austin.

Army Engineers Test Welded Aluminum Trusses

The U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia, are conducting structural tests on four full-size experimental all-welded aluminum truss panels for a military tactical bridge.

Believed to be the first of their kind in the U. S., these truss panels have been fabricated by Aluminum Company of America from one of the new non-heat-treatable, weldable aluminum alloys.

It is anticipated that the truss components will support a 60-ton tank load on approximately a 90-ft. span. A Corps of Engineers bulletin explains that, in order to obtain this capacity in the past, when high strength, heat-treatable aluminum alloys were used, it was necessary to build-up basic panel members by neutral axis welding. The panel components were then joined by riveting or bolting.

The bridge trusses are divided into light-weight, simply connected panels. All of the panel members were fabricated from aluminum alloy 5456-H321 plate stock with 42,000 psi ultimate tensile strength. The upper and lower chords are box sections, and the diagonal and vertical members are built-up wide flange sections. All of the welding was accomplished by the inert gas-shielded metal arc method using consumable electrode.

Heavy Concrete Forms Lifted by Rubber Vacuum Mats

Rubber vacuum mats are used to lift loads of all types and almost any weight. Cylindrical objects such as large diameter concrete pipes, boilers and tubes and any type of flat surfaced object—even glass—lend themselves to such lifting.

Recently the publication *Rubber Developments* described the application of this method of lifting to various forms of concrete. The air between rubber mat and unit is first extracted and the unit is lifted by friction set up between its surface and the rubber strips fixed to the shutter surface.

In order to obtain full use of the lifting power provided in this way, the surface area of the rubber strips must be capable of providing the friction required. The mats are large in relation to the area to be raised and are in intimate contact with the surface; consequently stresses and strains in the load are not so great as when the weight is confined to small areas of support. This is of great importance in precasting concrete because it is now a relatively simple matter to lift large concrete elements without first providing the usual "handling" reinforcement.

Approve Calcium Chloride

Two types of calcium chloride have been embodied in tentative specifications approved by sponsoring committees and accepted by the American Society of Testing Materials and the American Association of State Highway Officials.

AN OPPORTUNITY FOR A QUALIFIED GROUP, COMPANY OR INDIVIDUAL

Very rarely found opportunity for a qualified organization, Company or individual who has had the past experience and is qualified to participate with a holder of large parcels of fine land in fine sections of St. Petersburg, Tampa, Clearwater and Pompano Beach areas. Large tracts of fine land that is ripe for development for Housing and also a Shopping Center to be erected in each area. The area is all FHA approved. Qualified and experienced parties will be selected and also to invest a very small or initial sum of money to undertake with the Holders of such land and go forward. Principals must have the proper equipment as Earth movers, Dredging machines Bull Dozers, etc. also the manpower. This is a very unusual opportunity to enter the field with very little Capital. If you feel you are qualified and have the know how. Write giving your experience and qualifications to the Karalina Development Corp. Att.: Mr. Karal. Weston 93, Mass.

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1—Second-hand Drop Ball (3200#)
9—New Well Drill Bits—3¼" x 4¼"—7 API Joints
2—PENNSYLVANIA, Class DE-2, two stage, duplex, cross compound, (direct connected), Synchronous Motor Driven Air Compressors.
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High Pressure Air Cylinder Diameter .....12"
Stroke .....14"
1—INGERSOLL-RAND Model GK 315 Air Compressor, Serial No. 507227
2—BUCYRUS-ERIE No. 12 Bit Dressers—Electrically driven
2—BUCYRUS-ERIE B-105 Oil Burning Bit Furnaces with Blowers
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CAT Model DW21, "Twin Stacks", S/N 8W507 motor scraper; 18 cu. yd. struck; Engine in very good condition; New pins and bushings in pull yoke; 24:00x29 24-ply tires front and rear; new recaps on front, rears 60% good. Cable control unit overhauled. READY TO GO TO WORK!

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BUCYRUS 15B Backhoe Attachment	1,000.00
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Bucyrus-Erie 38-B's, 51-B's, 54-B's, cranes—drags, shovels, diesels, wide long cats—long booms.

Marion, Koehring, Link Belt & Lorain model cranes—drags—shovels, wide long cats—diesels. Also backhoe equipped machines, all types.

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1—P & H Model 655 Dragline. Has 855 Swingers & Brakes. Machine 3 yrs. old. Excellent shape. F.O.B. Car, Marion, Ill. $35,000

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2400 Lima Shovel front attachment.
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6" and 9" Drills, Diesel and Electric.

other equipment available not listed above.

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100 T.P.H. Plant . . . As Pictured August 1, 1958

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RATED H.P.		Powerful Replacement For	
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162 @ 1400 RPM		✱ Drills	✱ Compressors
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3 Caterpillar D-8 Tractors

1—with push plate
1—with angle dozer
1—with bulldozer
All 2U Series Tractors
Excellent Tractors
Ready to go to Work
$30,000 for 3 Units

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1 Compton Coal Auger, Model 36.
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1—HD-14 Allis-Chalmers Crawler, LeTourneau blade with double drum winch in excellent shape. Also, 12 yd. hydraulic Gar-Wood Pan	6,000.00
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1—3 H.P. Henry Phase Converter for operating 3 phase motor from single phase line	55.00

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NEW 1958 Ford T950 Cab and Chasis, 156″ WB, CA 84.5, Tandem Axle, 477 Cu in Eng, 5 Speed XHD Trans, 3 Spd Aux Trans, 15000# Front Axle, Heater, Turn Signals, West Coast Mirrors, 10 1000x12 12 Ply Tires, New Truck guarantee. $11,000.00

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7—Model 2460 Gradalls, serial numbers from #NP26372 to #NP34709, excellent condition.

1—LeTourneau-Westinghouse C Tournatractor, serial #GW70329CW-S, late model with cab, torque converter, down pressure cable blade, excellent condition.

5—LeTourneau-Westinghouse C Tournamatic Tournapulls, cab, full equipment, serial numbers from #GT6049 to #GP-30154, excellent condition.

8—LeTourneau-Westinghouse D Tournapulls, cab, full equipment, serial numbers from GT8625 to GT8898, good to excellent condition.

1—Caterpillar D8 (torque-converter, serial #15A1677 with 8S bulldozer and Model 29 cable unit, excellent condition throughout.

1—Allis-Chalmers HD-15C, serial #2986, DD-PCU and bulldozer, good condition.

All equipment ready to go to work and priced to sell.

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Lorain Moto-Crane Model 254W—35,000 pound capacity. #27670 mounted on a 6 x 4 carrier, #6930. Purchased new in May of 1956, it has been used very little. It has a 65 foot boom and a fair lead for a dragline bucket. Power up or down. It has been used 600 working hours. $22,000 Selling Price—$34,000 Cost.

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Buffalo-Springfield 5 Ton Tandem Roller, #K7. It is a 1955 Model and has been used very little. $3,000 Selling Price—$4,500 Cost.

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1—LeTourneau tractor drawn scraper, Model LP	$3,200
1—T-9 International tractor with Bucyrus-Erie angle dozer S/N 8925-T4	$2,500
1—D7 Tractor with rear double drum PCU and 7A angle dozer S/N 3T5240	$7,200
1—Parsons Model 221-2A trench machine, maximum depth 11 ft., 16" to 32" width, S/N 2093	$4,500
1—Koehring longitudinal finish machine 12-28 ft. S/N LF 1433	$4,800
1—Koehring longitudinal finish machine 10-12 ft. S/N LF 1037	$1,400
1—Koehring longitudinal finish machine 8-12 ft. S/N LF 1127	$2,800
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1—390 bbl. Johnson cement bin, less elevator	$1,200

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14 - Model 63TD 22 Ton
Rear Dumps
(1955 and 1956)

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(Long Sault Dam)
Kiewit - Utah Companies
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● **Two-story administration structure under construction for Los Angeles County Road Department. A yard building, not shown, is part of the new project.**

County Road Headquarters

Construction is under way on a new $3,159,000 County of Los Angeles Road Department Administrative Center near the city's civic center. The 163,000 sq. ft. project comprises a two-story administration building and a central yard office building.

Road Commissioner Sam Kennedy reports that the county department maintains 4,200 miles of roads and 450 bridges; also an additional 1,000 miles of roads under contract with various cities. The new center will provide the most advanced road maintenance facilities in the nation, Kennedy said. More than 500 engineering, and clerical employees, who comprise the various divisions of the department, will be housed at the new center.

• A $500 million bond issue is being considered for financing Oklahoma's long-range highway program, with a study ordered by the Oklahoma State Legislative council.

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For Fast Efficient Ice Control. New model illustrated spreads from left side only . . . saves material and gives better pattern. Also choose from many other hydraulic, cab-operated spreaders; PTO or engine driven hopper types; or the low cost pull-type spreader.

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For Safe, High Speed Snow Removal. Reversible and one-way plows for 1½ to 5 ton trucks and up. Hydraulic power lift controls to meet your specifications. Underframe or front push models.

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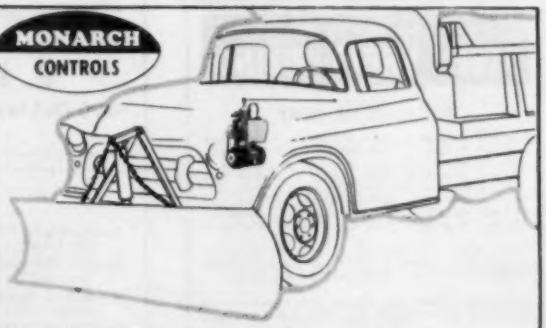

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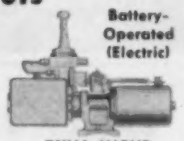
One man lifts or lowers the snow plow automatically from the cab . . . with MONARCH Power Hydraulic Controls. More than 50,000 installations. Simple to install. Write for full details or see your dealer.



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MONARCH ROAD MACHINERY COMPANY
1331 Michigan St., N. E. — Grand Rapids 3, Michigan

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Traffic Safety

Pushbutton Control of Speed-Lane Signs

A radical new "pushbutton" Speed and Lane Control, Sign-Signal system developed by Michigan Highway Department researchers has been installed on the Mackinac Bridge and is now in operation.

Described by state highway commissioner John C. Mackie as a "major advance in traffic engineering", the system involves a set of five very large overhead signs whose legends are controlled at a switchboard in the administrative building at the St. Ignace end.

The sign-signals, being developed for possible future use on Michigan's urban expressways, will instruct the motorist on which lanes are open and which are closed to traffic, as well as indicate safe travel speeds.

The signs are supported by huge overhead aluminum trusses. The signs themselves are visible for 1,000 feet.

Design specifications and requirements were developed by the Michigan State Highway Traffic division under the direction of Edward Gervais.

The speed limit indicators will be located centrally over the four lanes and will be visible from both directions, while the lane control panels will be installed directly over each lane.

The signing includes an illuminated SPEED sign with letters 16 inches in height with illuminated speed listings below for either "15", "30" or "45" miles per hour. The panels are of the "blackout" type and will not show unless illuminated. Green illuminated arrows will indicate lanes open for use and a large deep orange "X" illuminated panel will indicate lanes closed to traffic.

The installations are being made at five locations on the bridge and necessary information will be flashed to the St. Ignace control point by radio equipped patrol cars. In case of an accident, the lane control signs can be switched to direct traffic to free lanes. Speed controls can be adjusted for icy weather conditions or in case of other emergencies on the bridge, Mackie said.

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CHROME CLAD®... won't rust, chip or peel

There's no paint on a Lufkin Chrome Clad Mezurall® tape rule blade. It's all metal.

The bold, black markings are bonded to the basic metal . . . protected with several electroplatings that give extra strength to the blade. The final coat is Lufkin's exclusive Chrome Clad finish. Glare free, smooth, rust resistant . . . the most durable tape rule you can buy. **Plated steel case** is light, strong, long-lasting. Blades are easily replaceable. Come in 6, 8, 10 and 12-foot lengths . . . either ½" or ¾" width.

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An ARROW MOBILE HYDRAULIC HAMMER working on a Dayton, Ohio, street, breaking street, gutters and curbing.

POWER TO SPARE for BREAKING CONCRETE

With a 1,000 pound weight and an EIGHT foot drop—something's gotta give. If it's concrete you're breaking, it gives quickly and easily, when you put an ARROW MOBILE HYDRAULIC HAMMER on the job. Saves you time and money on other jobs, too, such as cutting asphalt—tamping backfill—driving posts or piling. If you have any of these jobs to do now, here's a tip, ask to see what an ARROW MOBILE HYDRAULIC HAMMER can do on YOUR job.

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Arrow Manufacturing Company

196 WEST DAKOTA DENVER, COLORADO

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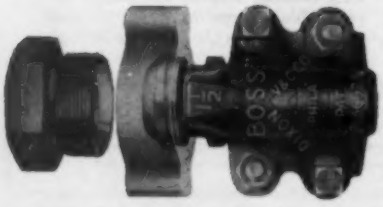
Safest Connections for Pile Driver Hose
AND OTHER STEAM, AIR, WATER AND HYDRAULIC APPLICATIONS

"GJ-BOSS"
GROUND-JOINT FEMALE COUPLING STYLE X-34



The original *washerless* coupling that is unequalled for *safety* in every high pressure service, and will therefore serve with exceptional efficiency and economy on all low-pressure applications. Built to withstand hard use and rough handling. Ground-joint union between stem and spud provides leak-proof, trouble-free seal...no lost or worn-out washers to replace. All parts malleable iron or steel, thoroughly rustproofed. Furnished with super-strong "Boss" Offset and Interlocking Clamps. Sizes ¼" to 6", inclusive.

COMPANION MALE COUPLING
"BOSS", STYLE MX-16

Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Will prove equally efficient and economical for all applications where standard iron pipe nipples are normally used. Each size fits same size hose . . . oversize hose not required. Coupling consists of I.P.T. male stem and "Boss" Offset and Interlocking Clamp. Steel or malleable iron, thoroughly rustproofed. Sizes ¼" to 6", inclusive.

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Court Decisions for Contractors

Depreciation Decision

The Federal District Court of Delaware in Hertz Corp. - (2 AFTR 2d 5350) has ruled on the validity of an IRS regulation regarding useful life of an asset. The regulation upheld by the court reads as follows:

"The estimated useful life of an asset is not necessarily the useful life *inherent* in the asset but is the period over which the asset may reasonably be expected to be useful to the taxpayer in his trade or business . . . This period shall be determined by reference to his experience with similar property, taking into account present conditions and probably future developments."

Salvage value has caused considerable concern to taxpayers. It has been in the law for several years, its enforcement is of recent origin. Both the straight-line and sum-of-the-digits methods now require the deduction of salvage value from the basic amount before the rate is applied. This is not required under the declining balance method. However, the regulations now say that depreciation must stop when the total deductions reduce the basis to salvage value. There were some court decisions on this rule but none of them were final.

As this subject is reviewed, greater becomes the conviction that it is necessary in the early future to get the Internal Revenue Service out of the legislative field. Regulations tend, more and more, to become law and not subject to change. Thus the IRS becomes legislative rather than administrative.

Right-of-Way Decision

A Kentucky State Court has ruled that it is the obligation of the State Highway Department to provide a contractor right-of-way access without obstructions to a project let by them. Failure to do so is a breach of a binding contract made by the Highway Department, and governmental immunity does not apply to such a breach. The Contractor, in such cases, has the right in Kentucky to sue the State, without its permission, to recover damages for delays. The case concerned the removal of utilities installations in the construction area.

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Penflex flexible metal hose assures trouble-free transmission of hot tar for road surfaces on paving mixers, road spraying trucks and tar and asphalt heaters. It gives you all of the ruggedness of steel pipe and easy flexibility of hose. Stands up against abrasion, high heat and crushing. Resists kinking and allows free-flowing transmission of tar.

Penflex Hand Hose is insulated with heavy braided asbestos and encased with sturdy outer hose section. Available in 1" I.D. with heatproof fittings.

Tar and Asphalt Heater Hose, leakproof, long-lasting with plain end fittings. Made in 2" I.D. size and other sizes.

Penflex Tank Car Heating Hose made in superheat, rust resisting bronze.

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Gives complete technical details and specifications on flexible metallic hose.

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TIGHT AS A PIPE BUT... FLEXIBLE

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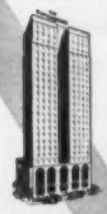

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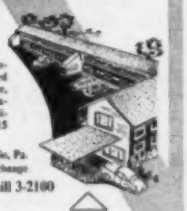

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